

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
PERMIT  
FOR A HAZARDOUS WASTE MANAGEMENT FACILITY**

Permittee Shell Oil Company  
P.O. Box 711  
Marina Vista and Shell Ave.  
Martinez, CA 94553

Facility Identification Number:  
CAD 009 164 021

Pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 USC 6901 et seq., commonly known as RCRA) and regulations promulgated thereunder by the U.S. Environmental Protection Agency (EPA) (codified and to be codified in Title 40 of the Code of Federal Regulations), a Permit is issued to Shell Oil Company (hereafter called the Permittee), to operate a hazardous waste storage, and incineration facility located in Martinez, CA on Marina Vista and Shell Avenue (3485 Pacheco Blvd., shipping address), at latitude 38° 01' 18" and longitude 122° 06' 59" summarily described as follows:

The original RCRA Part A application listed many hazardous waste units. The permittee subsequently amended the Part A application requesting the deletion of most of these units. On June 30, 1988 EPA made a determination on the request to delete various units from the Part A. This permit covers those units that are subject to RCRA permitting requirements. This includes the following: (1) the RM-17 incinerator, associated appurtenances, feed tank, and air pollution equipment, and (2) the three CO boilers, associated appurtenances, feed tank, and air pollution equipment. If it is later determined that additional units are subject to RCRA permitting requirements, a permit application for these units will be requested by EPA.

The facility is subject to corrective action requirements under this permit. A corrective action order was issued under RCRA §3008(h) on March 6, 1989. It is intended that this permit eventually replace the order and that any items remaining to be completed under the order will be completed under the requirements of this permit.

The Permittee must comply with all terms and conditions of this Permit. This Permit consists of the conditions contained herein (including those in any attachments) and the applicable regulations contained in 40 CFR Parts 260 through 266, 268, 270, and 124, as specified in the Permit. Applicable regulations are those which are in effect on the date of issuance of the Permit, in accordance with 40 CFR § 270.32(c).

This Permit is based on the assumption that the information submitted in the Part B Permit Application attached to the Permittee's letter dated September 30, 1988, as modified by subsequent amendments dated February 1, 1989 and May 12, 1989; the RM-17 incinerator Trial Burn Report, dated October 28, 1988, revised June 5, 1989; the CO Boiler Trial Burn Plan, dated November 21, 1988; and the CO Boiler Trial Burn Report, dated April 21, 1989, (hereafter collectively referred to as the Application) is accurate and that the facility will be constructed and operated as specified in the Application.

Any inaccuracies found in the submitted information may be grounds for the termination, revocation and reissuance, or modification of this Permit in accordance with 40 CFR §§ 270.41, 270.42, and 270.43 and for enforcement action. The Permittee must inform EPA of any deviation from or changes in the information in the application which would affect the Permittee's ability to comply with the applicable regulations or permit conditions.

CAD 009 164 021

This Permit is effective as of June 30, 1990 and shall remain in effect until June 30, 1995 unless revoked and reissued under 40 CFR § 270.41, terminated under 40 CFR § 270.43, or continued in accordance with 270.51(a).

5-8-90

Date

  
\_\_\_\_\_  
Jeff Zelikson  
Director

Hazardous Waste Management Division

# RCRA Hazardous Waste Facility Permit for Shell Oil Company at Martinez, CA

## TABLE of CONTENTS

COVER SHEET/ SIGNATURE PAGE	un-numbered (2pp)
TABLE OF CONTENTS	i
SECTION I - GENERAL PERMIT CONDITIONS	1
I.A.    EFFECT OF PERMIT	1
I.B.    PERMIT ACTIONS	1
I.B.1.    Permit Modification, Revocation and Reissuance, and Termination	1
I.B.2.    Permit Renewal	1
I.C.    SEVERABILITY	1
I.D.    ORDER OF PRECEDENCE	1
I.E.    DEFINITIONS	2
I.F.    DUTIES AND REQUIREMENTS	2
I.F.1.    Duty to Comply	2
I.F.2.    Duty to Reapply	2
I.F.3.    Permit Expiration	2
I.F.4.    Need to Halt or Reduce Activity Not a Defense	2
I.F.5.    Duty to Mitigate	2
I.F.6.    Proper Operation and Maintenance	3
I.F.7.    Duty to Provide Information	3
I.F.8.    Inspection and Entry	3
I.F.9.    Monitoring and Records	3
I.F.10.    Reporting Planned Changes	4
I.F.11.    Reporting Anticipated Noncompliance	4
I.F.12.    Certification of Construction or Modification	4
I.F.13.    Transfer of Permits	5
I.F.14.    Twenty-Four Hour Reporting	5
I.F.15.    Other Noncompliance	6
I.F.16.    Other Information	6
I.G.    SIGNATORY REQUIREMENT	6
I.H.    REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE REGIONAL ADMINISTRATOR	6
I.I.    CONFIDENTIAL INFORMATION	6
I.J.    DOCUMENTS TO BE SUBMITTED PRIOR TO OPERATION	7
I.K.    DOCUMENTS TO BE MAINTAINED AT THE FACILITY	7
I.L.    WASTE MINIMIZATION CERTIFICATION AND REPORT	7

SECTION II - GENERAL FACILITY CONDITIONS	9
II.A. DESIGN AND OPERATION OF FACILITY	9
II.B. REQUIRED NOTICES	9
II.B.1. Hazardous Waste Imports	9
II.B.2. Hazardous Waste from Off-Site Sources	9
II.C. GENERAL WASTE ANALYSIS	9
II.D. SECURITY	9
II.E. GENERAL INSPECTION REQUIREMENTS	10
II.F. PERSONNEL TRAINING	10
II.G. SPECIAL PROVISIONS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE	10
II.H. PREPAREDNESS AND PREVENTION	10
II.H1. Required Equipment	10
II.H2. Testing and Maintenance of Equipment	10
II.H3. Access to Communications or Alarm System	10
II.H4. Required Aisle Space	10
II.H5. Arrangements with Local Authorities	10
II.I. CONTINGENCY PLAN	11
II.I.1. Implementation of Plan	11
II.I.2. Copies of Plan	11
II.I.3. Amendments to Plan	11
II.I.4. Emergency Coordinator	11
II.J. MANIFEST SYSTEM	11
II.K. RECORDKEEPING AND REPORTING	11
II.K.1. Operating Record	11
II.K.2. Biennial Report	11
II.L. GENERAL CLOSURE REQUIREMENTS	11
II.L.1. Performance Standard	11
II.L.2. Amendment to Closure Plan	12
II.L.3. Notification of Closure	12
II.L.4. Time Allowed For Closure	12
II.L.5. Disposal or Decontamination of Equipment, Structures, and Soils	12
II.L.6. Certification of Closure	12
II.L.7. Survey Plat	12
II.M. COST ESTIMATE FOR FACILITY CLOSURE	12
II.N. FINANCIAL ASSURANCE FOR FACILITY CLOSURE	13
II.O. LIABILITY REQUIREMENTS	13
II.P. INCAPACITY OF OWNERS OR OPERATORS, GUARANTORS, OR FINANCIAL INSTITUTIONS	13
II.Q. RISK ASSESSMENT	13



<b>SECTION III - VESSEL 482</b>	<b>14</b>
III.A. SECTION HIGHLIGHTS	14
III.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION	14
III.C. SECONDARY CONTAINMENT AND INTEGRITY ASSESSMENTS	14
III.D. OPERATING REQUIREMENTS	14
III.E. RESPONSE TO LEAKS OR SPILLS	15
III.F. INSPECTION SCHEDULES AND PROCEDURES	16
III.G. RECORDKEEPING AND REPORTING	16
III.H. CLOSURE AND POST-CLOSURE CARE	17
III.I. SPECIAL TANK PROVISIONS FOR IGNITABLE OR REACTIVE WASTES	17
<b>SECTION IV - TANKS 1065, 383, &amp; 12038</b>	<b>18</b>
IV.A. SECTION HIGHLIGHTS	18
IV.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION	18
IV.C. SECONDARY CONTAINMENT AND INTEGRITY ASSESSMENTS	18
IV.D. OPERATING REQUIREMENTS	19
IV.E. RESPONSE TO LEAKS OR SPILLS	19
IV.F. INSPECTION SCHEDULES AND PROCEDURES	20
IV.G. RECORDKEEPING AND REPORTING	21
IV.H. CLOSURE AND POST-CLOSURE CARE	21
IV.I. SPECIAL TANK PROVISIONS FOR IGNITABLE OR REACTIVE WASTES	22
IV.J. COMPLIANCE SCHEDULE	22
<b>SECTION V - INCINERATION - RM-17</b>	<b>23</b>
V.A. SECTION HIGHLIGHTS	23
V.B. IDENTIFICATION CRITERIA FOR PERMITTED AND PROHIBITED WASTE	24
V.C. CONSTRUCTION, INSTRUMENTATION, AND OPERATIONAL PERFORMANCE REQUIREMENTS	25
V.D. INSPECTION REQUIREMENTS	27
V.E. MONITORING REQUIREMENTS	28
V.F. WASTE FEED CUT-OFF REQUIREMENTS	29
V.G. CLOSURE	30
V.H. RECORDKEEPING	31
V.I. COMPLIANCE SCHEDULE	31
<b>SECTION VI - INCINERATION - CO BOILERS</b>	<b>32</b>
VI.A. SECTION HIGHLIGHTS	32

VI.B.	IDENTIFICATION CRITERIA FOR PERMITTED AND PROHIBITED WASTE	33
VI.C.	CONSTRUCTION, INSTRUMENTATION, AND OPERATIONAL PERFORMANCE REQUIREMENTS	34
VI.D.	INSPECTION REQUIREMENTS	36
VI.E.	MONITORING REQUIREMENTS	37
VI.F.	WASTE FEED CUT-OFF REQUIREMENTS	38
VI.G.	CLOSURE	39
VI.H.	RECORDKEEPING	39
VI.I.	COMPLIANCE SCHEDULE	39
SECTION VII - SHORT-TERM TEST INCINERATION		40
VII.A.	SECTION HIGHLIGHTS	40
VII.B.	TRIAL BURN PHASE	40
VII.B.1.	CONFORMITY TO TRIAL BURN PLAN	40
VII.B.2.	TRIAL BURN POHCs	40
VII.B.3.	TRIAL BURN DETERMINATIONS	41
VII.B.4.	TRIAL BURN DATA SUBMISSIONS AND CERTIFICATIONS	41
VII.C.	REPORTING NON-COMPLIANCE DURING THE TRIAL BURN	41
VII.D.	COMPLIANCE SCHEDULE	42
SECTION - VIII CORRECTIVE ACTION		43
VIII.A.	SUMMARY OF FINDINGS & RFA RESULTS	43
VIII.B.	DEFINITIONS	51
VIII.C.	STANDARD CONDITIONS	52
VIII.D.	REPORTING REQUIREMENTS	53
VIII.E.	NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF NEWLY IDENTIFIED SOLID WASTE MANAGEMENT UNITS(S)	53
VIII.F.	NOTIFICATION REQUIREMENTS FOR NEWLY-DISCOVERED RELEASES AT SWMUS	54
VIII.G.	WORK TO BE PERFORMED	55
VIII.H.	QUALITY ASSURANCE	58
VIII.I.	PUBLIC COMMENT AND PARTICIPATION	58
VIII.J.	ON-SITE AND OFF-SITE ACCESS	59
VIII.K.	SAMPLING AND DATA/DOCUMENT AVAILABILITY	59
VIII.K.	RECORD PRESERVATION	60
VIII.M.	PROJECT COORDINATOR	60
VIII.N.	SUBSEQUENT MODIFICATION	60
VIII.O.	TERMINATION AND SATISFACTION	61
VIII.P.	FACILITY SUBMISSION SUMMARY	62

## **SECTION I - GENERAL PERMIT CONDITIONS**

### **I.A. EFFECT OF PERMIT**

The Permittee is allowed to store, treat and incinerate hazardous waste in accordance with the conditions of this Permit. Any storage, treatment or incineration of hazardous waste not authorized in this Permit is prohibited. Subject to 40 CFR § 270.4, compliance with this Permit generally constitutes compliance, for purposes of enforcement, with Subtitle C of RCRA. Issuance of this Permit does not convey any property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local law or regulations. Compliance with the terms of this Permit does not constitute a defense to any order issued or any action brought under Sections 3008(a), 3008(h), 3013, or 7003 of RCRA; Sections 106(a), 104 or 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq., commonly known as CERCLA), or any other law providing for protection of public health or the environment. [40 CFR § 270.4, 270.30(g)]

### **I.B. PERMIT ACTIONS**

#### **I.B.1. Permit Modification, Revocation and Reissuance, and Termination**

This Permit may be modified, revoked and reissued, or terminated for cause, as specified in 40 CFR § 270.41, 270.42, and 270.43. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittee, does not stay the applicability or enforceability of any permit condition. [40 CFR § 270.4(a) and 270.30(f)]

#### **I.B.2. Permit Renewal**

This Permit may be renewed as specified in 40 CFR § 270.30(b) and Permit Condition I.F.2. Review of any application for a Permit renewal shall consider improvements in the state of control and measurement technology, as well as changes in applicable regulations. [40 CFR § 270.30(b), HSWA Sec. 212]

### **I.C. SEVERABILITY**

The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby. [40 CFR § 124.16(a)]

### **I.D. ORDER OF PRECEDENCE**

In the event of any inconsistency between the permit and the permit attachments, the permit shall govern. In the event of any inconsistency between the permit attachments and the permit application, the permit attachments shall govern.

## I.E. DEFINITIONS

For purposes of this Permit, terms used herein shall have the same meaning as those in 40 CFR Parts 124, 260, 264, 266, 268, and 270, unless this Permit specifically provides otherwise; where terms are not defined in the regulations or the Permit, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term. "Director" means the Director of the Hazardous Waste Management Division, EPA Region 9, or his designee or authorized representative.

## I.F. DUTIES AND REQUIREMENTS

### I.F.1. Duty to Comply

The Permittee shall comply with all conditions of this Permit, except to the extent and for the duration such noncompliance is authorized by an emergency Permit. Any Permit noncompliance, other than noncompliance authorized by an emergency Permit, constitutes a violation of RCRA and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application. [40 CFR § 270.30(a)]

### I.F.2. Duty to Reapply

If the Permittee wishes to continue an activity allowed by this Permit after the expiration date of this Permit, the Permittee shall submit a complete application for a new Permit at least 180 days prior to Permit expiration. [40 CFR § 270.10(h), 270.30(b)]

### I.F.3. Permit Expiration

Pursuant to 40 CFR § 270.50, this Permit shall be effective for a fixed term not to exceed ten years. As long as EPA is the Permit-issuing authority, this Permit and all conditions herein will remain in effect beyond the Permit's expiration date, if the Permittee has submitted a timely, complete application (see 40 CFR § 270.10, 270.13 through 270.29) and, through no fault of the Permittee, the Director has not issued a new Permit, as set forth in 40 CFR § 270.51.

### I.F.4. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee, in an enforcement action that it would have been necessary, to halt or reduce the Permitted activity in order to maintain compliance with the conditions of this Permit. [40 CFR § 270.30(c)]

### I.F.5. Duty to Mitigate

In the event of noncompliance with this Permit, the Permittee shall take all reasonable steps to minimize releases to the environment and shall carry out such measures, as are reasonable, to prevent significant adverse impacts on human health or the environment. [40 CFR § 270.30(d)]



I.F.6. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit. [40 CFR § 270.30(e)]

I.F.7. Duty to Provide Information

The Permittee shall furnish to the Director, within a reasonable time, any relevant information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this Permit. [40 CFR § 264.73, 264.74(a), 270.30(h)]

I.F.8. Inspection and Entry

Pursuant to 40 CFR § 270.30(i), the Permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents, as may be required by law, to:

- I.F.8.a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;
- I.F.8.b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;
- I.F.8.c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and
- I.F.8.d. Sample or monitor, at reasonable times, for the purposes of assuring Permit compliance or as otherwise authorized by RCRA, any substances or parameters at any location.

I.F.9. Monitoring and Records

- I.F.9.a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method from Appendix I of 40 CFR Part 261 or an equivalent method approved by the Director. Laboratory methods must be those specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods SW-846, Standard Methods of Wastewater Analysis, or an equivalent method, as specified in the

Waste Analysis Plan (See Permit Attachment 1). [40 CFR § 270.30(j)(1)]

I.F.9.b. The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this Permit, the certification required by 40 CFR § 264.73(b)(9), and records of all data used to complete the application for this Permit for a period of at least 3 years from the date of the sample, measurement, report, record, certification, or application. These periods may be extended by request of the Director at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility. The Permittee shall maintain records from all ground-water monitoring wells and associated ground-water surface elevations for the active life of the facility. [40 CFR § 264.74(b) and 270.30(j)(2)]

I.F.9.c. Pursuant to 40 CFR § 270.30(j)(3), records of monitoring information shall specify:

- i. The dates, exact place, and times of sampling or measurements;
- ii. The individuals who performed the sampling or measurements;
- iii. The dates analyses were performed;
- iv. The individuals who performed the analyses;
- v. The analytical techniques or methods used; and
- vi. The results of such analyses.

I.F.10. Reporting Planned Changes

The Permittee shall give notice to the Director, as soon as possible, of any planned physical alterations or additions to the Permitted facility. [40 CFR § 270.30(l)(1)]

I.F.11. Reporting Anticipated Noncompliance

The Permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR § 270.30(l)(2)]

I.F.12. Certification of Construction or Modification

The Permittee may not commence storage, treatment or incineration of hazardous waste in the modified portion of the facility until the Permittee has submitted to the Director, by certified mail or hand delivery, a letter signed by the Permittee and a registered professional engineer stating that

the facility has been constructed or modified in compliance with the Permit;  
and

I.F.12.a. The Director has inspected the modified or newly constructed facility and finds it is in compliance with the conditions of the Permit; or

I.F.12.b. The Director has either waived the inspection or has not within 15 days notified the Permittee of his intent to inspect. [40 CFR § 270.30(l)(2)]

I.F.13. Transfer of Permits

This Permit is not transferable to any person, except after notice to the Director. The Director may require modification or revocation and reissuance of the Permit pursuant to 40 CFR § 270.40. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of 40 CFR Parts 264 and 270 and this Permit. [40 CFR § 270.30(l)(3), 264.12(c)]

I.F.14. Twenty-Four Hour Reporting

I.F.14.a. The Permittee shall report to the Director any noncompliance which may endanger health or the environment. Any such information shall be reported orally within 24 hours from the time the Permittee becomes aware of the circumstances. The report shall include the following:

- i. Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies.
- ii. Any information of a release or discharge of hazardous waste, or of a fire or explosion from the hazardous waste management facility which could threaten the environment or human health outside the facility.

I.F.14.b. The description of the occurrence and its cause shall include:

- i. Name, address, and telephone number of the owner or operator;
- ii. Name, address, and telephone number of the facility;
- iii. Date, time, and type of incident;
- iv. Name and quantity of materials involved;
- v. The extent of injuries, if any;
- vi. An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and

vii. Estimated quantity and disposition of recovered material that resulted from the incident.

I.F.14.c. A written submission shall also be provided within five days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period(s) of noncompliance (including exact dates and times); whether the noncompliance has been corrected; and, if not, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Director may waive the five-day written notice requirement in favor of a written report within 15 days. [40 CFR § 270.30(l)(6)]

I.F.15. Other Noncompliance

The Permittee shall report all other instances of noncompliance not otherwise required to be reported above, Permit Conditions I.F.10. - 15., annually by February 15 of each year to cover noncompliance of the previous calendar year.. The reports shall contain the information listed in Permit Condition I.F.14 [40 CFR § 270.30(l)(10)]

I.F.16. Other Information

Whenever the Permittee becomes aware that it failed to submit any relevant facts in the Permit application, or submitted incorrect information in a Permit application or in any report to the Director, the Permittee shall promptly submit such facts or information. [40 CFR § 270.30(l)(11)]

I.G. SIGNATORY REQUIREMENT

All applications, reports, or information submitted to or requested by the Director, his designee, or authorized representative, shall be signed and certified in accordance with 40 CFR § 270.11 and 270.30(k).

I.H. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE REGIONAL ADMINISTRATOR

All reports, notifications, or other submissions which are required by this Permit to be sent or given to the Director should be sent by certified mail or given to:

Division Director (attn: H-3-3)  
Hazardous Waste Management Division  
U.S. Environmental Protection Agency  
1235 Mission Street  
San Francisco, CA 94103.

I.I. CONFIDENTIAL INFORMATION

In accordance with 40 CFR § 270.12, the Permittee may claim confidential any information required to be submitted by this Permit.

**I.J.            DOCUMENTS TO BE SUBMITTED PRIOR TO OPERATION**

Prior to operation, the Permittee shall submit as-built plans and the engineer's certification of Tank 12038. At a minimum, these plans shall indicate: Wall thicknesses, overflow controls, secondary containment, and appurtenant equipment to the unit.

**I.K.            DOCUMENTS TO BE MAINTAINED AT THE FACILITY**

The Permittee shall maintain at the facility, until closure is completed and certified by an independent, registered professional engineer, the following documents and all amendments, revisions and modifications to these documents:

1.     Waste Analysis Plan, as required by 40 CFR § 264.13 and this Permit.
2.     Inspection schedules, as required by 40 CFR § 264.15(b)(2) and this Permit.
3.     Personnel training documents and records, as required by 40 CFR § 264.16(d) and this Permit.
4.     Contingency Plan, as required by 40 CFR § 264.53(a) and this Permit.
5.     Operating record, as required by 40 CFR § 264.73 and this Permit.
6.     Closure Plan, as required by 40 CFR § 264.112(a) and this Permit.
7.     Post-Closure Plan, as required by 40 CFR § 264.118(a) and this Permit.
8.     Annually-adjusted cost estimate for facility closure, as required by 40 CFR § 264.142(d) and this Permit.
9.     All other documents required by Permit Conditions I.F.9 , III.E.5., III.F&G., IV.E.5., IV.F&G, V.D, E, F, H, & I, VI.D, E, F, H, &I, VII.B, C, & D, and Section VIII.

**I.L.            WASTE MINIMIZATION CERTIFICATION AND REPORT**

- I.L.1.            The Permittee shall retain original signed copies for the last three years from the date of certification of the following statement on waste minimization:

"I hereby certify under penalty of law that personnel under my direction and supervision at this facility are undertaking specific steps in accordance with a program in place to minimize the amount and toxicity of hazardous wastes generated at this facility to a degree economically practicable, and that the method utilized for the treatment, storage, or disposal of hazardous waste is the practicable method currently available to this facility which minimizes the present and future threat to human health and the environment. I am aware that there are significant penalties for false certification, including the possibility of fine and imprisonment for flagrant falsification."

The permittee shall make this certification at least annually and shall retain these copies as part of the facility's written operation record as required in Permit Condition I.K.5.

- I.L.2.            The permittee shall prepare a biennial report detailing the specific waste minimization efforts in place that support the waste minimization

certification of Permit Condition I.L.1. This report shall also describe further waste minimization efforts that could be undertaken at the facility. This report shall be maintained at the facility as a part of the operating record, and the first such report shall be submitted to the Director no later than October 1, 1990. At a minimum, this report shall describe the following:

- a. Any written policy or statement that outlines goals, objectives, and/or methods for source reduction and recycling of hazardous waste at the facility.
- b. Any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities.
- c. Any source reduction and/or recycling assessments or audits conducted in the last five years or planned in the near future.
- d. Any source reduction and/or recycling measures implemented in the last five years or planned for the near future.
- e. The dollar amount of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous wastes.
- f. Factors that prevented implementation of source reduction and/or recycling opportunities.
- g. Sources of information on source reduction and/or recycling received at the facility (e.g. local government, trade associations, suppliers, etc.)
- h. An investigation of additional waste minimization efforts which could be implemented at the facility. This investigation shall analyze the potential for reducing the quantity and toxicity of each waste stream through production process change, production reformulation, recycling, and all other appropriate means. The analysis shall include an assessment of the technical feasibility, cost, and potential waste reduction for each option.

I.L.3. The Director may, consistent with 40 CFR 270.41 and 40 CFR Part 124, require the permittee to implement waste reduction alternatives, based upon the Director's determination that such alternatives are feasible and necessary for improved protection of public health and the environment.

I.L.4. The permittee is limited to treatment by incineration of no more than 15,380 tons per calendar year of waste, combined in RM-17 incineration and CO Boilers. Such limit may be exceeded only if facility production exceeds 221,000 barrels per day on an annual basis and the total hazardous waste generation rate as a ratio to total product production does not exceed the rate that existed in 1987 (ref. Table XVII.1, page XVII.4 of Part B Application)



## **SECTION II - GENERAL FACILITY CONDITIONS**

### **II.A. DESIGN AND OPERATION OF FACILITY**

The Permittee shall construct, maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned, sudden or nonsudden release of hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment, as required by 40 CFR § 264.31.

### **II.B. REQUIRED NOTICES**

#### **II.B.1. Hazardous Waste Imports**

The Permittee shall notify the Director in writing at least four weeks in advance of the date the Permittee expects to receive hazardous waste from a foreign source, as required by 40 CFR § 264.12(a). Notice of subsequent shipments of the same waste from the same foreign source in the same calendar year is not required.

#### **II.B.2. Hazardous Waste from Off-Site Sources**

When the Permittee is to receive hazardous waste from an off-site source (except where the Permittee is also the generator), he must inform the generator in writing that he has the appropriate Permits, and will accept the waste the generator is shipping. The Permittee must keep a copy of this written notice as part of the operating record. [40 CFR § 264.12(b)]

### **II.C. GENERAL WASTE ANALYSIS**

The Permittee shall follow the waste analysis procedures required by 40 CFR § 264.13, as described in the attached Waste Analysis Plan, Permit Attachment 1.

The Permittee shall verify the analysis of each waste stream twice annually, except as noted below, as part of its quality assurance program, in accordance with Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA Publication SW-846, or equivalent methods approved by the Director. At a minimum, the Permittee shall maintain proper functional instruments, use approved sampling and analytical methods, verify the validity of sampling and analytical procedures, and perform correct calculations. If the Permittee uses a contract laboratory to perform analyses, then the Permittee shall inform the laboratory in writing that it must operate under the waste analysis conditions set forth in this Permit.

Sulfinol Reclaimer Bottoms shall be analyzed each time it is generated, not always annually. RM-17 waste shall be analyzed each production run, and every six months if production runs exceed six months.

### **II.D. SECURITY**

The Permittee shall comply with the security provisions of 40 CFR § 264.14(b)(2) and (c) and Permit Attachment 2.

## II.E. GENERAL INSPECTION REQUIREMENTS

The Permittee shall follow the inspection schedule set out in Permit Attachment 3. The Permittee shall remedy any deterioration or malfunction discovered by an inspection, as required by 40 CFR § 264.15(c). Records of inspection shall be kept, as required by 40 CFR § 264.15(d).

## II.F. PERSONNEL TRAINING

The Permittee shall conduct personnel training, as required by 40 CFR § 264.16. This training program shall follow the attached outline, Permit Attachment 4. The Permittee shall maintain training documents and records, as required by 40 CFR § 264.16(d) and (e).

## II.G. SPECIAL PROVISIONS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

The Permittee shall comply with the requirements of 40 CFR § 264.17(a). The Permittee shall follow the procedures for handling ignitable, reactive, and incompatible wastes set forth in Permit Attachment 23.

## II.H. PREPAREDNESS AND PREVENTION

### II.H1. Required Equipment

At a minimum, the Permittee shall maintain at the facility the equipment set forth in the Contingency Plan, Permit Attachment 5, as required by 40 CFR § 264.32.

### II.H2. Testing and Maintenance of Equipment

The Permittee shall test and maintain the equipment specified in Permit Condition II.H1, as necessary, to assure its proper operation in time of emergency, as required by 40 CFR § 264.33.

### II.H3. Access to Communications or Alarm System

The Permittee shall maintain access to the communications or alarm system, as required by 40 CFR § 264.34.

### II.H4. Required Aisle Space

At a minimum, the Permittee shall maintain aisle space, as required by 40 CFR § 264.35.

### II.H5. Arrangements with Local Authorities

The Permittee shall maintain arrangements with state and local authorities, as required by 40 CFR § 264.37. If state or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operating record.

## II.I. CONTINGENCY PLAN

### II.I.1. Implementation of Plan

The Permittee shall immediately carry out the provisions of the Contingency Plan, Permit Attachment 5, whenever there is a fire, explosion, or release of hazardous waste or constituents which could threaten human health or the environment.

### II.I.2. Copies of Plan

The Permittee shall comply with the requirements of 40 CFR § 264.53.

### II.I.3. Amendments to Plan

The Permittee shall review and immediately amend, if necessary, the Contingency Plan, as required by 40 CFR § 264.54.

### II.I.4. Emergency Coordinator

A trained emergency coordinator shall be available at all times in case of an emergency, as required by 40 CFR § 264.55.

The names, addresses, and phone numbers of all persons qualified to act as emergency coordinators shall be supplied to the Director at the time of certification. [40 CFR § 264.52(d)].

## II.J. MANIFEST SYSTEM

The Permittee shall comply with the manifest requirements of 40 CFR § 264.71, 264.72, and 264.76.

## II.K. RECORDKEEPING AND REPORTING

In addition to the recordkeeping and reporting requirements specified elsewhere in this Permit, the Permittee shall do the following:

### II.K.1. Operating Record

The Permittee shall maintain a written operating record at the facility, in accordance with 40 CFR § 264.73.

### II.K.2. Biennial Report

The Permittee shall comply with the biennial reporting requirements of 40 CFR § 264.75.

## II.L. GENERAL CLOSURE REQUIREMENTS

### II.L.1. Performance Standard

The Permittee shall close the facility, as required by 40 CFR § 264.111 and in accordance with the Closure Plan, Permit Attachment 6.

II.L.2.      Amendment to Closure Plan

The Permittee shall amend the Closure Plan, in accordance with 40 CFR § 264.112(c), whenever necessary.

II.L.3.      Notification of Closure

The Permittee shall notify the Director in writing at least 60 days prior to the date on which he expects to begin closure of any of the following: tank or incinerator, or final closure of the facility, as required by 40 CFR § 264.112(d).

II.L.4.      Time Allowed For Closure

After receiving the final volume of hazardous waste, the Permittee shall treat, remove from the unit or facility, or dispose of on site all hazardous waste and shall complete closure activities, in accordance with 40 CFR § 264.113 and the schedules specified in the Closure Plan, Permit Attachment 6.

II.L.5.      Disposal or Decontamination of Equipment, Structures, and Soils

The Permittee shall decontaminate and/or dispose of all contaminated equipment, structures, and soils, as required by 40 CFR § 264.114 and the Closure Plan, Permit Attachment 6.

II.L.6.      Certification of Closure

The Permittee shall certify that the facility has been closed in accordance with the specifications in the Closure Plan, as required by 40 CFR § 264.115.

II.L.7.      Survey Plat

The Permittee shall submit a survey plat no later than the submission of certification of closure of each hazardous waste disposal unit, in accordance with 40 CFR § 264.116.

II.M.      COST ESTIMATE FOR FACILITY CLOSURE

II.M.1.      The Permittee's most recent closure cost estimate, prepared in accordance with 40 CFR § 264.142 264.144, and 264.197(c)(3) and (5), is specified in Permit Attachment 7.

II.M.2.      The Permittee must adjust the closure cost estimate for inflation within 60 days prior to the anniversary date of the establishment of the financial instrument(s) used to comply with 40 CFR § 264.143 and Permit Condition II.N or when using an approved state-required mechanism, upon such date as required by the state. [40 CFR § 264.142(b)],

or, if a financial guarantee or corporate guarantee is used,

the Permittee must adjust the closure cost estimate for inflation within 30 days after the close of the firm's fiscal year and before submission of updated information to the Director, as specified in 40 CFR § 264.142(b).

II.M.3. The Permittee must revise the closure cost estimate whenever there is a change in the facility's Closure Plan, as required by 40 CFR § 264.142(c).

II.M.4. The Permittee must keep at the facility the latest closure cost estimate as required by 40 CFR § 264.142(d).

## II.N. FINANCIAL ASSURANCE FOR FACILITY CLOSURE

The Permittee shall demonstrate continuous compliance with 40 CFR 264.143 and 264.146 by providing documentation of financial assurance, as required by 40 CFR § 264.151 or 264.149, in at least the amount of the cost estimates required by Permit Condition II.M. Changes in financial assurance mechanisms must be approved by the Director pursuant to 40 CFR § 264.143 or 264.149.

## II.O. LIABILITY REQUIREMENTS

The Permittee shall demonstrate continuous compliance with the requirement of 40 CFR § 264.147(a) to have and maintain liability coverage for sudden and accidental occurrences in the amount of at least \$1 million per occurrence, with an annual aggregate of at least \$2 million, exclusive of legal defense costs.

## II.P. INCAPACITY OF OWNERS OR OPERATORS, GUARANTORS, OR FINANCIAL INSTITUTIONS

The Permittee shall comply with 40 CFR § 264.148, whenever necessary.

## II.Q. RISK ASSESSMENT

The Permittee shall update the risk assessment to incorporate changes in assessment procedures, cancer potencies, and facility operations as a part of the application for a renewal of this permit. The assessment shall be submitted a minimum of 12 months prior to expiration of this permit, unless otherwise directed by the Director.

## **SECTION III - VESSEL 482**

### **III.A. SECTION HIGHLIGHTS**

This Section concerns Vessel 482, which is an aboveground feed tank for the RM-17 incinerator system and ancillary equipment. Vessel 482 is not classified as a hazardous waste storage tank under RCRA since it is completely emptied of waste every 90 days. Vessel 482 is included in the permit as part of the RM-17 Incinerator system and must comply with Subpart J of 40 CFR, except Section 265.197(c) and 265.200. The age of the Vessel 482 system is about 22 years old. It is used only to contain RM-17 wastes for feed into the RM-17 incinerator. The RM-17 wastes are a mixture of Toluene recycle and light ends. The secondary containment system contains 6200 gallons, which is adequate for all of the waste. Special permit conditions for this tank include required submittals of several items of documentation .

### **III.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION**

- III.B.1. The Permittee may store a total volume of 3985 gallons of hazardous waste in Vessel 482, subject to the terms of this Permit and as follows:

<b>Tank No</b>	<b>Capacity (Gallons)</b>	<b>Dimensions of Tank</b>	<b>Secondary Containment Required</b>	<b>Description of Hazardous Waste</b>	<b>Hazardous Waste No.</b>
Vessel 482	3985	9 ft(diam) x 8 ft 4.5" height	yes-in place	RM-17 waste (toluene recycle and light ends )	D001, U220

- III.B.2. The Permittee is prohibited from storing or treating hazardous waste that is not identified in Permit Condition III.B.1.

### **III.C. SECONDARY CONTAINMENT AND INTEGRITY ASSESSMENTS**

The Permittee shall operate the secondary containment system, in accordance with the detailed design plans and descriptions contained in Permit Attachment 8. [40 CFR § 264.193(b)-(f)]

### **III.D. OPERATING REQUIREMENTS**

- III.D.1. The Permittee shall not place hazardous wastes or treatment reagents in the tank system if they could cause the tank, its ancillary equipment, or a containment system to rupture, leak, corrode, or otherwise fail. [40 CFR § 264.194(a)]
- III.D.2. The Permittee shall prevent spills and overflows from the tank or containment systems using the methods described in Permit Attachment 10. [40 CFR § 264.194(b)]



### III.E. RESPONSE TO LEAKS OR SPILLS

In the event of a leak or a spill from the tank system, from a secondary containment system, or if a system becomes unfit for continued use, the Permittee shall remove the system from service immediately and complete the following actions: [40 CFR § 264.196(a)-(f)]

III.E.1. Stop the flow of hazardous waste into the system and inspect the system to determine the cause of the release.

III.E.2. Remove waste and accumulated precipitation from the system within 24 hours of the detection of the leak to prevent further release and to allow inspection and repair of the system. If the Permittee finds that it will be impossible to meet this time period, the Permittee shall notify the Director and demonstrate that the longer time period is required.

If the collected material is a RCRA hazardous waste, it must be managed in accordance with all applicable requirements of 40 CFR Parts 262-264. The Permittee shall note that if the collected material is discharged through a point source to U.S. waters or to a POTW, it is subject to requirements of the Clean Water Act. If the collected material is released to the environment, it may be subject to reporting under 40 CFR Part 302.

III.E.3. Contain visible releases to the environment. The Permittee shall immediately conduct a visual inspection of all releases to the environment and based on that inspection: (1) prevent further migration of the leak or spill to soils or surface water and (2) remove and properly dispose of any visible contamination of the soil or surface water.

III.E.4. Close the system in accordance with the Closure Plan, Permit Attachment 6, unless the following actions are taken:

III.E.4.a. For a release caused by a spill that has not damaged the integrity of the system, the Permittee shall remove the released waste and make any necessary repairs to fully restore the integrity of the system before returning the tank system to service.

III.E.4.b. For a release caused by a leak from the primary tank system to the secondary containment system, the Permittee shall repair the primary system prior to returning it to service.

III.E.4.c. If the Permittee replaces a component of the tank system to eliminate the leak, that component must satisfy the requirements for new tank systems or components in 40 CFR § 264.192 and CFR § 40 264.193.

III.E.5. For all major repairs to eliminate leaks or restore the integrity of the tank system, the Permittee must obtain a certification by an independent, qualified, registered professional engineer that the repaired system is capable of handling hazardous wastes without release for the intended life of the system before returning the system to service. Examples of major repairs are: installation of an internal liner, repair of a ruptured tank, or repair or replacement of a secondary containment vault.

### **III.F.      INSPECTION SCHEDULES AND PROCEDURES**

- III.F.1.      The Permittee shall inspect the tank systems, in accordance with the Inspection Schedule, Permit Attachment 3, and shall complete the items in Permit Conditions III.F.2. and III.F.3. as part of those inspections:
- III.F.2.      The Permittee shall inspect the overflow controls, in accordance with the schedule in Permit Attachment 3. [40 CFR § 264.195(a)]
- III.F.3.      The Permittee shall visually inspect the following components of the tank system once each operating day: [40 CFR § 264.195(b)]
  - III.F.3.a.      Aboveground portions of the tank system, if any, to detect corrosion or releases of waste;
  - III.F.3.b.      Data gathered from monitoring and leak detection equipment (e.g., pressure or temperature gauges, monitoring wells) to ensure that the tank system is being operated according to its design;
  - III.F.3.c.      Construction materials and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system, to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation).
- III.F.4.      The Permittee shall inspect cathodic protection systems, in accordance with the following schedule: [40 CFR § 264.195(c)]
  - III.F.4.a.      The proper operation of the cathodic protection system must be confirmed within six months from initial installation and annually thereafter and
  - III.F.4.b.      All sources of impressed current must be inspected and tested every other month.
- III.F.5.      The Permittee shall document compliance with Permit Conditions III.F.2. through III.F.4. and place this documentation in the operating record for the facility. [40 CFR § 264.195(d)]

### **III.G.      RECORDKEEPING AND REPORTING**

- III.G.1.      The Permittee shall report to the Director, within 24 hours of detection, when a leak or spill occurs from the tank system or secondary containment system to the environment. [40 CFR § 264.196(d)(1)] (A leak or spill of one pound or less of hazardous waste, that is immediately contained and cleaned-up, need not be reported.) [40 CFR § 264.196(d)(2)] (Releases that are contained within a secondary containment system need not be reported). If the Permittee has reported the release pursuant to 40 CFR Part 302, this report satisfies the requirements of this Permit Condition. [40 CFR § 264.196(d)(1)]
- III.G.2.      Within 30 days of detecting a release to the environment from the tank system or secondary containment system, the Permittee shall report the following information to the Director: [40 CFR § 264.196(d)(3)]

- a. Likely route of migration of the release;
  - b. Characteristics of the surrounding soil (including soil composition, geology, hydrogeology, and climate);
  - c. Results of any monitoring or sampling conducted in connection with the release. If the Permittee finds it will be impossible to meet this time period, the Permittee should provide the Director with a schedule of when the results will be available. This schedule must be provided before the required 30-day submittal period expires;
  - d. Proximity of down gradient drinking water, surface water, and populated areas; and
  - e. Description of response actions taken or planned.
- III.G.3. The Permittee shall submit to the Director all certifications of major repairs to correct leaks within seven days from returning the tank system to use. [40 CFR § 264.196(f)]
- III.G.4. The Permittee shall obtain, and keep on file at the facility, the written statements by those persons required to certify the design and installation of the tank system. [40 CFR § 264.192(g)]
- III.G.5. The Permittee shall keep on file at the facility the written assessment of the tank system's integrity. [40 CFR § 264.191(a)]

### III.H. CLOSURE AND POST-CLOSURE CARE

- III.H.1. At closure of the tank system(s), the Permittee shall follow the procedures in the Closure Plan, Permit Attachment 6. [40 CFR § 264.197(a)]
- III.H.2. If the Permittee demonstrates that not all contaminated soils can be practically removed or decontaminated, in accordance with the Closure Plan, then the Permittee shall close the tank system(s) and perform post-closure care following the contingent procedures in the Closure Plan. [40 CFR § 264.197(b) and (c)]

### III.I. SPECIAL TANK PROVISIONS FOR IGNITABLE OR REACTIVE WASTES

- III.I.1. The Permittee shall not place ignitable or reactive waste in the tank system or in the secondary containment system, unless the procedures specified in Permit Attachment 11 are followed. [40 CFR § 264.198(a)]
- III.I.2. The Permittee shall comply with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjoining property line that can be built upon, as required in Tables 2-1 through 2-6 of the National Fire Protection Association's "Flammable and Combustible Liquids Code" (1977 or 1981). [40 CFR § 264.198(b)]

## **SECTION IV - TANKS 1065, 383, & 12038**

### **IV.A. SECTION HIGHLIGHTS**

This Section concerns tanks 1065, 383, and 12038. Tanks 1065 and 383 have been existing through 1989; but are being closed in accordance with an approved closure plan. The hazardous waste liquids consist of waste biosolids, DAF float and sulfinol reclaimer bottoms, which were previously mixed in Tank 1065 and pumped and stored in Tank 383 prior to being fed into the boilers. Tank 12038 is a new aboveground tank which replaces tank 1065, in location and replaces both tanks in function. Certification of closure of Tanks 1065 and 383 is required and engineering certification of Tank 12038 is required in Permit Condition IV.J.

### **IV.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION**

- IV.B.1. The Permittee may store and mix a total volume of 47,750 gallons of hazardous waste in one tank, subject to the terms of this Permit and as follows:

<b>Tank No</b>	<b>Capacity (Gallons)</b>	<b>Dimensions of Tank</b>	<b>Secondary Containment Required</b>	<b>Description of Hazardous Waste</b>	<b>Hazardous Waste No.</b>
12038	47,750	20 ft(diam) x 20 ft	yes, double shelled vessel	DAF float, Sulfinol Reclaimer Bottoms, Waste biosolids	K048, D007

- IV.B.2. The Permittee is prohibited from storing or treating hazardous waste that is not identified in Permit Condition IV.B.1.
- IV.B.3. The Permittee shall design, construct, and operate Tank 12038 in accordance with the detailed design plans and descriptions contained in Permit Attachment 9 and not operate the tank until an engineer's construction certification has been submitted and approved.

### **IV.C. SECONDARY CONTAINMENT AND INTEGRITY ASSESSMENTS**

- IV.C.1. For tank systems used to store or treat materials that are defined as hazardous waste in the future, the Permittee must obtain a written assessment of the existing tank system integrity within 12 months from the date the waste is defined as hazardous. [40 CFR § 264.191(c)] The assessment shall be certified by an independent, qualified, registered professional engineer. [40 CFR § 264.191(a) and (b)]
- IV.C.2. The Permittee shall design, construct, and operate the secondary containment system, in accordance with the detailed design plans and descriptions contained in Permit Attachment 12. [40 CFR § 264.193(b)-(f)]

#### IV.D. OPERATING REQUIREMENTS

- IV.D.1. The Permittee shall not place hazardous wastes or treatment reagents in the tank system if they could cause the tank, its ancillary equipment, or a containment system to rupture, leak, corrode, or otherwise fail. [40 CFR § 264.194(a)]
- IV.D.2. The Permittee shall prevent spills and overflows from the tank or containment systems using the methods described in Permit Attachment 14. [40 CFR § 264.194(b)]

#### IV.E. RESPONSE TO LEAKS OR SPILLS

In the event of a leak or a spill from the tank system, from a secondary containment system, or if a system becomes unfit for continued use, the Permittee shall remove the system from service immediately and complete the following actions: [40 CFR § 264.196(a)-(f)]

- IV.E.1. Stop the flow of hazardous waste into the system and inspect the system to determine the cause of the release.
- IV.E.2. Remove waste and accumulated precipitation from the system within 24 hours of the detection of the leak to prevent further release and to allow inspection and repair of the system. If the Permittee finds that it will be impossible to meet this time period, the Permittee shall notify the Director and demonstrate that the longer time period is required.  
  
If the collected material is a RCRA hazardous waste, it must be managed in accordance with all applicable requirements of 40 CFR Parts 262-264. The Permittee shall note that if the collected material is discharged through a point source to U.S. waters or to a POTW, it is subject to requirements of the Clean Water Act. If the collected material is released to the environment, it may be subject to reporting under 40 CFR Part 302.
- IV.E.3. Contain visible releases to the environment. The Permittee shall immediately conduct a visual inspection of all releases to the environment and based on that inspection: (1) prevent further migration of the leak or spill to soils or surface water and (2) remove and properly dispose of any visible contamination of the soil or surface water.
- IV.E.4. Close the system in accordance with the Closure Plan, Permit Attachment 6, unless the following actions are taken:
  - IV.E.4.a. For a release caused by a spill that has not damaged the integrity of the system, the Permittee shall remove the released waste and make any necessary repairs to fully restore the integrity of the system before returning the tank system to service.
  - IV.E.4.b. For a release caused by a leak from the primary tank system to the secondary containment system, the Permittee shall repair the primary system prior to returning it to service.
  - IV.E.4.c. For a release to the environment caused by a leak from a component of the tank system that is below ground and does not have secondary containment, the Permittee must provide this component

with secondary containment that meets the requirements of 40 CFR § 264.193 before the component can be returned to service.

- IV.E.4.d. For a release to the environment caused by a leak from the aboveground portion of the tank system that does not have secondary containment, and can be visually inspected, the Permittee shall repair the tank system before returning it to service.
- IV.E.4.e. For a release to the environment caused by a leak from the portion of the tank system component that is not readily available for visual inspection, the Permittee shall provide secondary containment that meets the requirements of 40 CFR § 264.193 before the component can be returned to service.
- IV.E.4.f. If the Permittee replaces a component of the tank system to eliminate the leak, that component must satisfy the requirements for new tank systems or components in 40 CFR § 264.192 and 40 CFR § 264.193.
- IV.E.5. For all major repairs to eliminate leaks or restore the integrity of the tank system, the Permittee must obtain a certification by an independent, qualified, registered professional engineer that the repaired system is capable of handling hazardous wastes without release for the intended life of the system before returning the system to service. Examples of major repairs are: installation of an internal liner, repair of a ruptured tank, or repair or replacement of a secondary containment vault.

#### IV.F. INSPECTION SCHEDULES AND PROCEDURES

- IV.F.1. The Permittee shall visually inspect the tank systems, in accordance with the Inspection Schedule, Permit Attachment 3, and shall complete the items in Permit Conditions IV.F.2. and IV.F.3. as part of those inspections:
- IV.F.2. The Permittee shall inspect the overfill controls, in accordance with the schedule in Permit Attachment 3. [40 CFR § 264.195(a)]
- IV.F.3. The Permittee shall inspect the following components of the tank system once each operating day: [40 CFR § 264.195(b)]
  - IV.F.3.a. Aboveground portions of the tank system, if any, to detect corrosion or releases of waste;
  - IV.F.3.b. Data gathered from monitoring and leak detection equipment (e.g., pressure or temperature gauges, monitoring wells) to ensure that the tank system is being operated according to its design;
  - IV.F.3.c. Construction materials and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system, to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation).
- IV.F.4. The Permittee shall document compliance with Permit Conditions IV.F.2. through IV.F.4. and place this documentation in the operating record for the facility. [40 CFR § 264.195(d)]



#### IV.G. RECORDKEEPING AND REPORTING

- IV.G.1. The Permittee shall report to the Director, within 24 hours of detection, when a leak or spill occurs from the tank system or secondary containment system to the environment. [40 CFR § 264.196(d)(1)] (A leak or spill of one pound or less of hazardous waste, that is immediately contained and cleaned-up, need not be reported.) [40 CFR § 264.196(d)(2)] (Releases that are contained within a secondary containment system need not be reported). If the Permittee has reported the release pursuant to 40 CFR Part 302, this report satisfies the requirements of this Permit Condition. [40 CFR § 264.196(d)(1)]
- IV.G.2. Within 30 days of detecting a release to the environment from the tank system or secondary containment system, the Permittee shall report the following information to the Director: [40 CFR § 264.196(d)(3)]
- a. Likely route of migration of the release;
  - b. Characteristics of the surrounding soil (including soil composition, geology, hydrogeology, and climate);
  - c. Results of any monitoring or sampling conducted in connection with the release. If the Permittee finds it will be impossible to meet this time period, the Permittee should provide the Director with a schedule of when the results will be available. This schedule must be provided before the required 30-day submittal period expires;
  - d. Proximity of down gradient drinking water, surface water, and populated areas; and
  - e. Description of response actions taken or planned.
- IV.G.3. The Permittee shall submit to the Director all certifications of major repairs to correct leaks within seven days from returning the tank system to use. [40 CFR § 264.196(f)]
- IV.G.4. The Permittee shall obtain, and keep on file at the facility, the written statements by those persons required to certify the design and installation of the tank system. [40 CFR § 264.192(g)]
- IV.G.5. The Permittee shall keep on file at the facility the written assessment of the tank system's integrity. [40 CFR § 264.191(a)]

#### IV.H. CLOSURE AND POST-CLOSURE CARE

- IV.H.1. At closure of the tank system(s), the Permittee shall follow the procedures in the Closure Plan, Permit Attachment 6. [40 CFR § 264.197(a)]
- IV.H.2. If the Permittee demonstrates that not all contaminated soils can be practically removed or decontaminated, in accordance with the Closure Plan, then the Permittee shall close the tank system(s) and perform post-closure care following the contingent procedures in the Closure Plan. [40 CFR § 264.197(b) and (c)]

IV.I. SPECIAL TANK PROVISIONS FOR IGNITABLE OR REACTIVE WASTES

- IV.I.1. The Permittee shall not place ignitable or reactive waste in the tank system or in the secondary containment system. [40 CFR § 264.198(a)]
- IV.I.2. The Permittee shall comply with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjoining property line that can be built upon, as required in Tables 2-1 through 2-6 of the National Fire Protection Association's "Flammable and Combustible Liquids Code" (1977 or 1981). [40 CFR § 264.198(b)]

IV.J. COMPLIANCE SCHEDULE

The Permittee shall provide the following information to the Director:

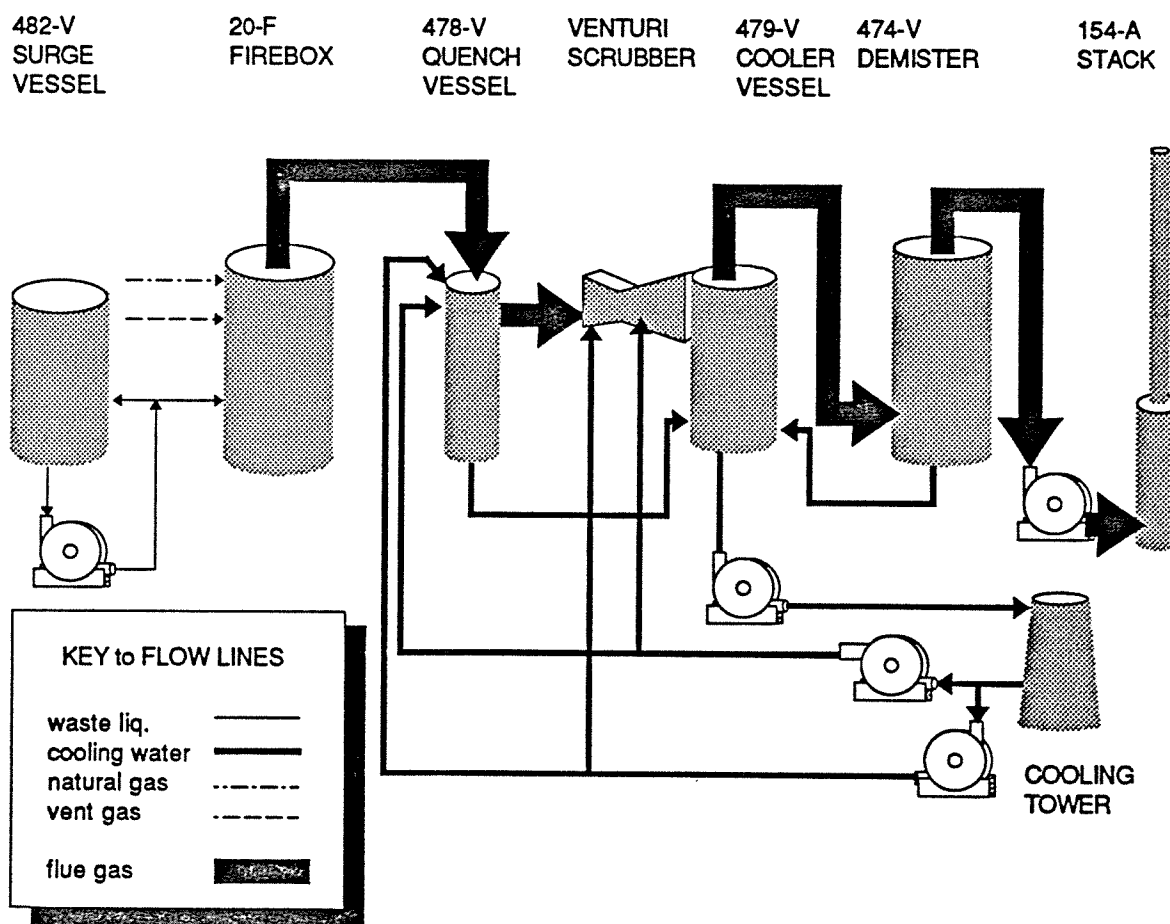
Item	Date Due to the Director
1. Documentation of Tank 383 closure and certification being completed	30 days after completion of closure
2. Documentation of Tank 1065 closure and certification being completed	30 days after completion of closure
3. Documentation of completion of construction on Tank 12038, including submittal of as-built drawings, and engineer's certification	30 days after completion of construction / installation

## SECTION V - INCINERATION - RM-17

### V.A SECTION HIGHLIGHTS

The RM-17 incinerator is a liquid injection incinerator with a nominal heat rating of 12 million BTUs per hour. Air and combustion gasses are moved by an induced draft fan designed for a suction flowrate of 8,400 actual cubic feet per minute at 90°F and 75 inches water column. The air pollution controls consist of a quench vessel, a venturi scrubber, a cooler vessel and a demister vessel. Flue gas exits the stack at about 140°F. The schematic below shows the units that make up the RM-17 incinerator.

### Schematic - Sketch of RM-17 Incinerator



The permit allows a maximum waste feed rate of 0.85 gallons /minute (approximately 408 pounds per hour) and requires a minimum temperature of 1450°F be maintained in the firebox.

The incinerator burns two organic liquid waste streams and process vent gas, such wastes being from the manufacturing of RM-17. Only the toluene recycle waste stream is an EPA waste (U-220). This waste is generated intermittently at a rate of 10 to 30 tons per month and at an annual rate of 35 to 140 tons per year.

V.B. IDENTIFICATION CRITERIA FOR PERMITTED AND PROHIBITED WASTE

The Permittee may incinerate the following hazardous wastes, as specified in this Permit and only under the terms of this Permit. The Permittee may only feed the hazardous wastes as identified below at the facility subject to Permit Conditions V.C. through V.F., and V.H.

- V.B.1. The Permittee shall incinerate only hazardous wastes meeting the following criteria:
- V.B.1.a. No hazardous constituents shall have a heat of combustion less than that of Toluene (18,450 BTU/lb). The light ends waste stream is non-hazardous, under RCRA, and has a heat of combustion of 20,053 BTUs/lb.
  - V.B.1.b. The waste shall have no solids present.
  - V.B.1.c. The waste shall contain no halogens.
  - V.B.1.d. The physical state of the waste feed shall be liquids or gasses.
  - V.B.1.e. No waste, or combination of wastes, with a heating value of less than 18,400 BTU/lb shall be fed to the incinerator unless fed in conjunction with auxiliary fuel.
  - V.B.1.f. The viscosity of U-220 waste as fed to the liquid injection incinerator, including light ends, shall not exceed 10 cp.
  - V.B.1.g. Wastes containing tetramethyl succinonitrile (TMSN) shall not be fed at any time to this incinerator.
  - V.B.1.h. No hazardous wastes other than those generated on site at the Shell Oil Company, Martinez Manufacturing Complex, will be fed to this incinerator.

V.B.2. The Permittee may incinerate only the following waste streams:

Hazardous Waste No.	Description	Maximum Feed Rate
U-220, D001, (CWC 343)	Toluene Recycle	0.85 gallons/minute, hourly average, as a total of U-220 & CWC 223
CWC 223*	Light ends	0.85 gallons/minute, hourly average, as a total of U-220 & CWC 223
CWC 223, CWC 343	Vent Gas	as produced
* CWC = California Waste Code		

V.B.3. The Permittee shall conduct waste feed analysis once each production run, and every six months if production runs exceed six months (General Waste Analysis, II.C), in accordance with the Waste Analysis Plan, Permit Attachment 1, to verify that waste fed to the incinerator is within the physical and chemical composition limits specified in this Permit, including Condition V.C.10. Wastes shall be as described by Table V.A.7.1, ppV-5 & 6, and Table V.A.8, p V.9, and Table V.A.7.2, pp V.7 & 8, and Table V.A.8, p V.9, in the September 30, 1988 Part B application, only, as revised May 12, 1989. (Note: these pages contain Confidential Business Information and the Tables will not be found in the public review copies of the Part B permit application)

V.C. CONSTRUCTION, INSTRUMENTATION, AND OPERATIONAL PERFORMANCE REQUIREMENTS

V.C.1. The Permittee shall maintain the incinerator in accordance with the design plans and specifications contained in Permit Attachment 15.

V.C.2. The Permittee shall install and test all instrumentation in accordance with the design plans, performance specifications, and maintenance procedures contained in Permit Attachment 15 within six months after effective date of permit.

The Permittee shall maintain the incinerator so that when operated, in accordance with the operating requirements specified in this permit, it will meet the performance standards specified in Permit Conditions V.C.3. through V.C.5. [40 CFR § 264.343]

V.C.3. The incinerator shall achieve a destruction and removal efficiency (DRE) of at least 99.99 percent for each of the following principal organic hazardous constituents (POHC) for each waste feed. The DRE value shall be determined using the method specified in 40 CFR § 264.343(a)(1). [40 CFR § 264.343(a)(1)]

<u>Waste Feed:</u>	<u>POHC:</u>
Toluene Recycle	Toluene
Light Ends	Toluene

- V.C.4. The Permittee shall control hydrogen chloride (HCl) emissions, such that the rate of emissions is no greater than the larger of either 1.8 kilograms per hour (4 pounds/hour) or one percent of the HCl in the stack gas, prior to entering any pollution control equipment. [40 CFR § 264.343(b)]
- V.C.5. The incinerator shall not emit particulate matter in excess of 180 milligrams per dry standard cubic meter (0.08 grains per dry standard cubic foot) when corrected for the amount of oxygen in the stack gas, in accordance with the formula specified in 40 CFR § 264.343(c). [40 CFR § 264.343(c)]

Except during the periods specified in the Permit Conditions for Short-Term Incineration under the Trial Burn Period, the Permittee shall feed the wastes described in Permit Condition V.B. to the incinerator only under the following conditions: [40 CFR § 264.345]

- V.C.6. Carbon monoxide concentration in the stack exhaust gas, monitored as specified in Permit Condition V.E., and corrected to 7% oxygen in the stack gas, shall not exceed 100 ppm at any time. The correction for oxygen will be made using the following formula and a constant oxygen concentration (% O<sub>2</sub>) determined at the start of each RM-17 production run while operating the unit at representative operating conditions:  $\text{Corrected CO} = \text{Stack Exhaust Gas CO} \times 14 / (21 - \% \text{O}_2)$  The determination shall be made by performing 3 two hour runs at the operating conditions planned for the production run. The oxygen meter shall be properly calibrated, and all operating conditions during the runs shall be documented and placed in the operating record.
- V.C.7. The Permittee shall be limited to the following waste feed rates in the following locations. Wastes shall only be fed to the firebox. The limits below are based on the combined feed of the Toluene Recycle and Light Ends waste streams.
- V.C.7.a. Maximum instantaneous firebox chamber organic liquid waste feed rate of 0.95 gallons per minute.
- V.C.7.b. Average firebox chamber organic liquid waste feed rate not to exceed 0.85 gallons per minute, over a one hour averaging period.
- V.C.8. Combustion temperature, monitored as specified in Permit Condition V.E., shall be maintained between 1450° F and 1800°F, on an hourly average.
- V.C.9. Combustion gas flow, monitored as specified in Permit Condition V.E., shall be no greater than 4,700 standard cubic feet per minute (scfm).



V.C.10. The mass feed rates of toxic metals to the incinerator shall not exceed:

Metal	Feed Rate	Metal	Feed Rate
Arsenic	<1 mg/kg	Antimony	<5 mg/kg
Barium:	2.4 mg/kg	Lead:	<5 mg/kg
Chromium	<1 mg/kg	Mercury	<0.1 mg/kg
Beryllium	<1 mg/kg	Silver:	2.6 mg/kg
Cadmium	<1 mg/kg	Thallium:	<5 mg/kg
Nickel	3.3 mg/kg		

V.C.11. The differential atomization steam pressure between atomizing steam and waste feed shall be no less than 15 psig.

V.C.12. The quench water flow rate shall be maintained at 40 gpm minimum.

V.C.13. Pressure drop across the venturi scrubber, monitored as specified in Permit Condition V.E., shall be maintained at no less than 9 inches H<sub>2</sub>O

V.C.14. The scrubber recirculation rate shall be maintained at no less than 100 gpm.

V.C.15. The Permittee shall control fugitive emissions from the combustion zone of the incinerator by maintaining the pressure in the firebox chamber, monitored as specified in Permit Condition V.E., at or above 0.3 inches of H<sub>2</sub>O draft. [40 CFR § 264.345(d)]

V.C.16. Compliance with the operating conditions specified in Permit Conditions V.C.6. through V.C.15. will be regarded as compliance with the required performance standards in Permit Conditions V.C.3. through V.C.5. However, evidence that compliance with these operating conditions is insufficient to ensure compliance with the performance standards, may justify modification, revocation, or reissuance of the Permit pursuant to 40 CFR § 270.41. [40 CFR § 264.343(d)]

#### V.D. INSPECTION REQUIREMENTS

The Permittee shall inspect the incineration unit in accordance with the Inspection Schedule, Permit Attachment 3, and shall complete the following as part of these inspections:

V.D.1. The Permittee shall visually inspect the incinerator and associated equipment (including pumps, valves, conveyors, pipes, etc.) at least daily for leaks, spills, fugitive emissions, and signs of tampering in accordance with Permit Attachment 3. [40 CFR § 264.347(b)]

V.D.2. The Permittee shall visually inspect the instrumentation and strip charts which display and record the operating parameters specified in Conditions

V.C.6 through V.C.15 at least daily for out-of-tolerance monitored and/or recorded operational data.

- V.D.3. The Permittee shall test the emergency waste feed cut-off system and associated alarm at least monthly to verify operability, as specified in Permit Condition V.F.1. The waste feed cut-off system shall be tested by shutting off the waste feed in a controlled manner, temporarily blocking in the waste feed line, and reopening the waste liquid shutoff valve and then testing the shutoff alarm and operation of the shutoff valve. [40 CFR § 264.347(c)]

V.E. MONITORING REQUIREMENTS

- V.E.1. The Permittee shall maintain, calibrate, and operate monitoring equipment and record the data while incinerating hazardous waste, as specified below:

System Parameter	Monitor Type	Location	Recording Process	Calibration Details
Waste feed rate	flow meter	upstream from waste feed nozzle	Continuous strip chart	Monthly, within 5% of positively measured flow
Firebox Temperature	Shielded Thermocouple (TC)	at exit of firebox	Continuous strip chart	monthly - calibrate recorder per manufacturer's specification; cease waste feed operations and replace TC if TC fails
Atomizing Steam/Waste Feed	Differential Pressure	waste feed nozzle	Continuous strip chart	Quarterly, per manufacturer's specification
Carbon Monoxide	Gas filter IR correlation detector	upstream from induced draft fan	Continuous strip chart	Daily, per manufacturer's specification; yearly per 40 CFR 60 Appendix B, Performance Specification 4, & using 100 ppmv span value
Oxygen		upstream from induced draft fan	Continuous strip chart during start of each production run, not permanent installation	At start of production run, per 40 CFR 60 Appendix B, Performance Specification 3
Venturi $\Delta P$	pressure	venturi throat	Continuous strip chart	Quarterly, within 5% of inclined manometer
Firebox Draft	pressure	firebox	Continuous strip chart	Quarterly, within 5% of inclined manometer
Quench Water Flow Rate	flow meter	water line into vessel	Continuous strip chart	Yearly, within 5% of positively measured flow
Combustion Gas Flow	Hot wire	stack	Continuous strip chart	Quarterly, per manufacturer's specification

V.E.2      Upon request of the Agency, the Permittee shall perform sampling and analysis of the waste and exhaust emissions to verify that the operating requirements established in the Permit achieve the performance standards. [40 CFR § 264.347(a)(3)]

V.F.      WASTE FEED CUT-OFF REQUIREMENTS

V.F.1.      The Permittee shall construct and maintain the systems specified below to automatically cut off the hazardous waste feed to the incinerator at the levels specified below. Hazardous wastes shall be fed to the incinerator only

when all instruments required by this condition are on line and operating properly. Additional cutoff limits utilized by the facility are listed in Table 2-1, page 2-7, of the June 5, 1989 Trial Burn Report. These additional limits shall be followed except as they may conflict with more stringent limits set in this permit. At a minimum equipment shall be tested and maintained at the frequencies stipulated below

Parameter	Cut-Off Limits *	Test Frequency
Waste flow measurement	greater than 0.95 gallons per minute	Monthly
High CO	greater than 100 ppm	Monthly
Low Temperature	less than 1420°F	Monthly
Loss of Firebox Draft	less than 0.3 inch water column	Monthly
Pressure Drop Across Venturi Scrubber	less than 9 inches water column	Monthly
Combustion Gas Flow	greater than 4,700 scfm	Monthly
All of the above	if any instrument required for cutoff system is not operational, or if instrument span is exceeded	Monthly
* Cut-offs to be based on instantaneous instrument readings, initiated at second instrument reading where cut-off value is exceeded.		

V.F.2. In case of a malfunction of the automatic waste feed cut-off systems, the Permittee shall perform manual shut downs in accordance with the approved procedures in Permit Attachment 16. The Permittee shall not restart the incinerator until the problem causing the malfunction has been located and corrected.

V.F.3. The Permittee may deactivate the waste liquid shutoff system, temporarily, for an analyzer or instrument while the analyzer or instrument is being calibrated. A log sheet shall be maintained upon which the deactivation and reactivation of the waste feed cut-off system is documented. Alternatively the continuous chart for the instrument shall be stamped with a "reactivation stamp. If automatic activation and deactivation of the waste feed cutoff system is installed as part of the calibration system, the system shall have indicator lights to show the operational condition of the cutoff system to assist the operator in documenting that the cutoff system is always active during normal operations.

#### V.G. CLOSURE

The Permittee shall follow the procedures in the Closure Plan, Permit Attachment 6. [40 CFR § 264.351]

**V.H.        RECORDKEEPING**

- V.H.1.        The Permittee shall record and maintain, in the operating record for this permit, all monitoring and inspection data compiled under the requirements of this Permit (see Permit Condition I.E.9.b.). [40 CFR § 264.73 and 40 CFR § 264.347(d)]
- V.H.2.        The Permittee shall record in the operating record for this permit the date and time of all automatic waste feed shut-offs, including the triggering parameters, reason for the shut-off, and corrective actions taken. The Permittee shall also record all failures of the automatic waste feed shut-offs to function properly and corrective actions taken.

**V.I.        COMPLIANCE SCHEDULE**

The Permittee shall provide the following information to the Director:

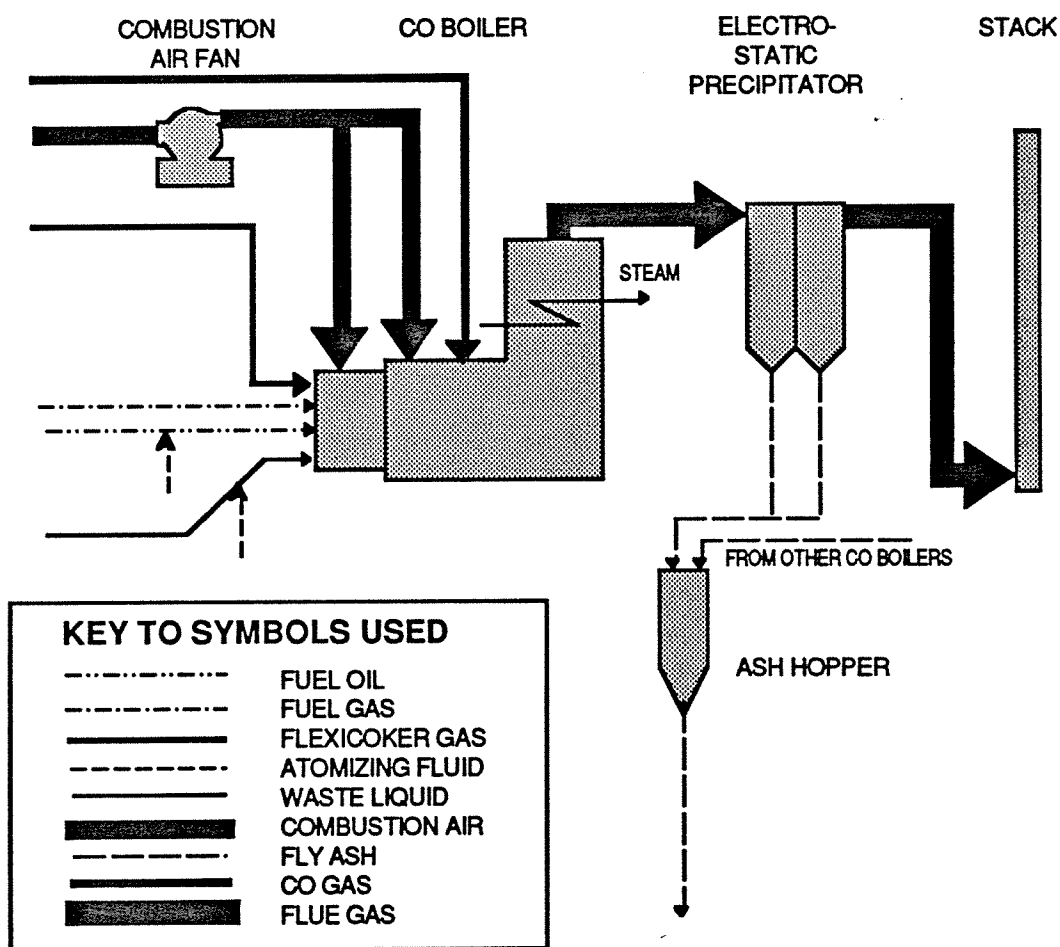
Item		Date Due to the Director
1.	Documentation that CO meter is installed and certification has been completed	Six months after the permit's effective date
2.	Submittal of inspection schedule for internal components of incinerator and air pollution control devices	Four months after the permit's effective date
3.	Documentation that all other cutoffs listed in Table on Section V.F.1. are installed and fully operational	Six months after the permit's effective date

## SECTION VI - INCINERATION - CO BOILERS

### VIA SECTION HIGHLIGHTS

There are three CO boilers, each essentially the same in design and operation. The hazardous waste liquids consist of waste biosolids, DAF float and sulfinol reclaimer bottoms, which are mixed and stored in Tank 12038 prior to being fed into the boilers. The boilers operate under positive pressure. They each have an electrostatic precipitator for air pollution control of particulates, followed by individual stacks. The sketch below provides a schematic of a typical unit.

**Schematic Sketch of CO Boiler**



The units operate on multiple feeds. These include the hazardous waste liquids, fuel gas, fuel oil, flexicoker gas, and regenerator (CO) gas. The hazardous waste liquids account for about 2% of the total heat load and about 1% of the mass input and are fed into Burners 1 and 4 of each boiler.

The permit allows a waste feed rate of up to 10 gallons per minute to each CO Boiler and requires a minimum firebox temperature of 1630°F. The CO limit is 100 ppm, 60 minutes rolling average. The trial burn tested CO Boiler 1 only. Trial burns are required on the other CO boiler units during the life of the permit (see Permit Condition VI.I.). The permit also requires upgrading of the continuous emission monitoring CO equipment on the three units (see Permit Condition VI.I.).

**VI.B. IDENTIFICATION CRITERIA FOR PERMITTED AND PROHIBITED WASTE**

Except during the periods specified in the conditions for Short-Term Incineration under the Trial Burn, the Permittee may incinerate the following hazardous wastes, as specified in this Permit and only under the terms of this Permit. The Permittee may only feed the hazardous wastes as identified below or further described in Permit Attachment 17, List of Wastes at the facility subject to Permit Conditions VI.C. through VI.F., and VI.H.

**VI.B.1.** The Permittee shall incinerate only hazardous wastes meeting the following criteria:

- VI.B.1.a.** No hazardous constituents shall have a heat of combustion less than that of Toluene (18,450 BTU/lb).
- VI.B.1.b.** The ash content of the waste shall be no greater than two (2) percent by weight.
- VI.B.1.c.** There shall be no organic chloride or other halogens in the waste feed.
- VI.B.1.d.** The physical state of the waste feed shall be liquid with a viscosity not exceeding 50 centipoise.
- VI.B.1.e.** Wastes shall always be fed in conjunction with auxiliary fuel.
- VI.B.1.f.** No hazardous wastes other than those generated on site at the Shell Oil Company, Martinez Manufacturing Complex, will be fed to this incinerator .

**VI.B.2.** The Permittee may incinerate only the following hazardous waste:

Hazardous Waste No.	Description	Feed Rate
K048	DAF float	10 gallons per minute as a combined total of the three waste stream elements, to each CO Boiler
D007	Sulfinol Reclaimer Bottoms	see above
none	Waste biosolids	see above

- VI.B.3. Throughout operation, the Permittee shall conduct waste analysis in accordance with the General Waste Analysis, II.C and the Waste Analysis Plan, Permit Attachment 1, to verify that waste fed to the incinerator is within the physical and chemical composition limits specified in this Permit.

VI.C. CONSTRUCTION, INSTRUMENTATION, AND OPERATIONAL PERFORMANCE REQUIREMENTS

- VI.C.1. The Permittee shall maintain the incinerator in accordance with the design plans and specifications contained in Permit Attachment 18.
- VI.C.2. The Permittee shall install and test all instrumentation in accordance with the design plans, performance specifications, and maintenance procedures contained in Permit Attachment 18 prior to handling hazardous wastes in the incinerator unit.

The Permittee shall maintain the incinerator so that when operated, in accordance with the operating requirements specified in this permit, it will meet the performance standards specified in Permit Conditions VI.C.3 through VI.C.5. [40 CFR § 264.343]

- VI.C.3. The incinerator shall achieve a destruction and removal efficiency (DRE) of at least 99.99 percent for each designated principal organic hazardous constituent (POHC) for each waste feed. The DRE value shall be determined using the method specified in 40 CFR § 264.343(a)(1).

Waste Feed:	POHC:
DAF Float	Toluene
Sulfinol Reclaimer Bottoms	Toluene

- VI.C.4. The Permittee shall control hydrogen chloride (HCl) emissions, such that the rate of emissions is no greater than the larger of either 1.8 kilograms per hour (4 pounds/hour) or one percent of the HCl in the stack gas, prior to entering any pollution control equipment. [40 CFR § 264.343(b)]
- VI.C.5. The incinerator shall not emit particulate matter in excess of 180 milligrams per dry standard cubic meter (0.08 grains per dry standard cubic foot) when corrected for the amount of oxygen in the stack gas, in accordance with the formula specified in 40 CFR § 264.343(c). [40 CFR § 264.343(c)]

Except during the periods specified in the Permit Conditions for Short-Term Incineration under the Trial Burn Period, the Permittee shall feed the wastes described in Permit Condition VI.B. to the incinerator only under the following conditions: [40 CFR § 264.345]

- VI.C.6. Carbon monoxide concentration in the stack exhaust gas, monitored as specified in Permit Condition VI.E., and corrected for the amount of oxygen in the stack gas, shall not exceed 100 ppm on a one hour rolling average.



- VI.C.7. The Permittee shall be limited to the following waste feed rates in the following locations: 10 gallons per minute of the combined waste feed at the firebox liquid waste burners of each CO Boiler (that is 30 gpm, total waste feed rate).
- VI.C.8. Combustion temperature, monitored as specified in Permit Condition VI.E., shall be maintained at 1600°F or greater.
- VI.C.9. Combustion gas flow, monitored as specified in Permit Condition VI.E., shall be no greater than 155,000 scfm.
- VI.C.10. The mass emission rates of toxic metals from each incinerator shall not exceed:

Metal	Emission Rate	Metal	Emission Rate
Arsenic	$2.4 \times 10^{-5}$ (grams/sec)	Antimony	$2.4 \times 10^{-5}$ (grams/sec)
Barium:	$2.4 \times 10^{-5}$ (grams/sec)	Lead:	$3.3 \times 10^{-4}$ (grams/sec)
Chromium	$1.03 \times 10^{-5}$ (grams/sec)	Mercury	* feed rate limit
Beryllium	$2.4 \times 10^{-5}$ (grams/sec)	Silver:	$2.0 \times 10^{-4}$ (grams/sec)
Cadmium	$3.3 \times 10^{-4}$ (grams/sec)	Thallium:	$2.4 \times 10^{-5}$ (grams/sec)
* Metal <u>Feed</u> Rate for Mercury shall be < 0.22 grams/minute from all feed sources.			

Emission rates are based on boiler stack emissions from all feed sources to a single CO boiler. Testing frequency shall be every two years at the time of trial burns. Testing shall be done using the most current EPA approved metals testing protocol(s). For compliance purposes, values for emission rates shall be the averages of a metal for all runs that are accepted by EPA as valid runs during a trial burn.

- VI.C.11. The differential atomization fluid pressure (e.g., steam, air) between atomizing fluid and the waste feed shall be no less than 15 psig.
- VI.C.12. The atomization fluid pressure for the fuel oil feed shall be no less than 20 psig when fuel oil is being fed to a CO boiler.
- VI.C.13. The power to the electrostatic precipitator (ESP) for each boiler, monitored as specified in Permit Condition VI.E., shall be maintained at no less than 20 KVA.
- VI.C.14. The Permittee shall control fugitive emissions from the combustion zone of the incinerator by inspecting the unit daily for leaks, and personnel shall wear a CO alarm during such inspections. Further the unit must maintain a positive pressure in the boiler, monitored as specified in Permit Condition VI.E., at less than 6 inches of water. [40 CFR § 264.345(d)]
- VI.C.15. No waste shall be fed to the incinerator until the boiler operation is fully stabilized. A period of at least 24 hours from the time a boiler is restarted

after a boiler shutdown after a power failure or other interruption of boiler operation shall lapse before waste is introduced into a boiler.

- VI.C.16. Compliance with the operating conditions specified in Permit Conditions VI.C.6. through VI.C.15. will be regarded as compliance with the required performance standards in Permit Conditions VI.C.3. through VI.C.5. However, evidence that compliance with these operating conditions is insufficient to ensure compliance with the performance standards, may justify modification, revocation, or reissuance of the Permit pursuant to 40 CFR § 270.41. [40 CFR § 264.343(d)]

#### VI.D. INSPECTION REQUIREMENTS

The Permittee shall inspect the incineration unit in accordance with the Inspection Schedule, Permit Attachment 3, and shall complete the following as part of these inspections:

- VI.D.1. The Permittee shall visually inspect the incinerator and associated equipment (including pumps, valves, conveyors, pipes, etc.) at least daily for leaks, spills, fugitive emissions, and signs of tampering in accordance with Permit Attachment 3. [40 CFR § 264.347(b)]
- VI.D.2. The Permittee shall visually inspect the strip charts which record the operating parameters specified in Item VI.C.6 through VI.C.15 at least daily for out-of-tolerance monitored and/or recorded operational data.
- VI.D.3. The Permittee shall test the emergency waste feed cut-off system and associated alarm at least monthly to verify operability, as specified in Permit Condition VI.F.1. The waste feed cut-off system shall not be tested while waste is being fed into boiler. The waste feed cut-off system shall be tested by shutting off the waste feed in a controlled manner, temporarily blocking off the waste feed line, and reopening the waste liquid shutoff valve and then testing the shutoff alarm and operation of the shutoff valve. [40 CFR § 264.347(c)]

## VI.E. MONITORING REQUIREMENTS

VI.E.1. The Permittee shall maintain, calibrate, and operate monitoring equipment and record the data while incinerating hazardous waste, as specified below:

System Parameter	Monitor Type	Location	Recording Process	Calibration Details
Waste feed rate	flow meter	upstream from waste feed nozzle	Continuous strip chart	Monthly, within 5% of positively measured flow
Temperature	Shielded Thermocouple (TC)	at exit of boiler	Continuous strip chart	monthly - calibrate recorder per manufacturer's specification
Atomizing Fluid	Differential Pressure	Fuel oil nozzle	Continuous strip chart	Quarterly, per manufacturer's specification
Atomizing Fluid/Waste Feed	Differential Pressure	Waste feed nozzle	Continuous strip chart	Quarterly, per manufacturer's specification
Carbon Monoxide	gas filter correlation w/ IR detector	In stack	Continuous strip chart	Daily, per manufacturer's specification; yearly per 40 CFR 60 Appendix B, Performance Specification 4, & using 500 ppmv span value
Oxygen	Micro fuel cell	At exit of boiler heat exchange section	Continuous strip chart	Daily, per manufacturer's specification; yearly per 40 CFR 60 Appendix B, Performance Specification 3
Firebox Pressure	pressure	firebox	Continuous strip chart	Quarterly, within 5% of inclined manometer
ESP Power	KVA	ESP	Continuous strip chart	Quarterly, per manufacturer's specification
Combustion Gas Flow	annubar flow meter (COB1) or pitot tube (COB 2 & 3)	stack	Continuous strip chart	Quarterly, per manufacturer's specification

VI.E.2 Upon request of the Agency, the Permittee shall perform sampling and analysis of the waste and exhaust emissions to verify that the operating requirements established in the Permit achieve the performance standards. [40 CFR § 264.347(a)(3)]

## VI.F. WASTE FEED CUT-OFF REQUIREMENTS

- VI.F.1. The Permittee shall construct and maintain the systems specified below to automatically cut off the hazardous waste feed to the incinerator at the levels specified below. Hazardous wastes shall be fed to the incinerator only when all instruments required by this condition are on line and operating properly. Additional cutoff limits utilized by the facility are listed in Table 7, page 21, of the November 21, 1988 Trial Burn Plan. These additional limits shall be followed except as they may conflict with more stringent limits set in this permit. At a minimum equipment shall be tested and maintained at the frequencies stipulated below

Parameter	Cut-Off Limits	Test Frequency
Waste flow measurement	greater than 10 gallons per minute *	monthly
High CO	greater than 100 ppm, rolling 60 minute average	monthly
Low Temperature	less than 1600°F *	monthly
High Firebox Pressure	more than 6 inches water column *	monthly
Combustion Gas Flow	greater than 180,000 scfm *	monthly
All of the above	if any instrument required for cutoff system is not operational, or if instrument span is exceeded	monthly
* Cut-offs to be based on instantaneous instrument readings, initiated at second instrument reading where cut-off value is exceeded.		

- VI.F.2. In case of a malfunction of the automatic waste feed cut-off systems, the Permittee shall perform manual shut downs in accordance with the approved procedures in Permit Attachment 19. The Permittee shall not restart the incinerator until the problem causing the malfunction has been located and corrected.

- VI.F.3. In accordance with approved procedures, as provided for in the following paragraph, the Permittee may temporarily deactivate the waste feed cut-off system for an analyzer or instrument while continuing to feed waste to a boiler only as necessary while the analyzer or instrument is being calibrated. The operating record shall contain the time a cutoff is deactivated and the time when it is reactivated along with the identification of the person(s) taking the action.

Proposed procedures to manage and document the deactivation and reactivation of the cut-off system shall be submitted for each analyzer or instrument needing cut-off deactivation and reactivation controls and upon approval the procedures shall become part of the Part B application

/Operations Plan. The proposal shall include analysis documenting the necessity for the deactivation.

- VI.F.4. The Permittee shall not feed any hazardous waste to the boilers until all the monitors specified in Section VI.E.1, operating controls specified in Section VI.E.3, and all the waste feed cut-off controls specified in Section VI.F.1 are installed and documentation certifying their installation is sent to the Director.

VI.G. CLOSURE

The Permittee shall follow the procedures in the Closure Plan, Permit Attachment 6. [40 CFR § 264.351]

VI.H. RECORDKEEPING

- VI.H.1. The Permittee shall record and maintain, in the operating record for this permit, all monitoring and inspection data compiled under the requirements of this Permit (see Permit Condition I.E.9.b.). [40 CFR § 264.73 and 40 CFR § 264.347(d)]
- VI.H.2. The Permittee shall record in the operating record for this permit the date and time of all automatic waste feed shut-offs, including the triggering parameters, reason for the shut-off, and corrective actions taken. The Permittee shall also record all failures of the automatic waste feed shut-offs to function properly and corrective actions taken.

VI.I. COMPLIANCE SCHEDULE

The Permittee shall provide the following information to the Director:

Item	Date Due to the Director
1. Documentation that CO meters are installed and certification is completed	See Condition VI.F.3.
2. Documentation that O <sub>2</sub> meters are installed and certification are completed	See Condition VI.F.3.
3. Documentation that all cutoffs listed in Table on Section VI.F.1. are installed and properly operating.	See Condition VI.F.3.

## **SECTION VII - SHORT-TERM TEST INCINERATION**

### **VII.A. SECTION HIGHLIGHTS**

A trial burn is required for the RM-17 Incinerator permit renewal. It is scheduled for late in 1993.

A trial burn is required for each hazardous waste incinerator (CO Boiler) during the permit period. CO Boiler 1 was tested during December 1988 and January 1989. The two remaining CO Boilers were not tested. This section requires testing/retesting on a two year interval for the three units, a six year interval for each.

### **VII.B. TRIAL BURN PHASE**

#### **VII.B.1. CONFORMITY TO TRIAL BURN PLAN**

The Permittee shall operate and monitor the incinerator during the trial burn phase as specified in the Trial Burn Plan, Permit Attachment 20. The Trial Burn Plan shall be updated, revised, and resubmitted by the Permittee six (6) months prior to conducting the trial burn or a performance test required under Permit Condition V.E.2. or VI.E.2. of this permit. Upon EPA approval, the revised trial burn plan becomes the current Attachment 20 to this permit. The revised Trial Burn Plan must include all applicable EPA-approved test methods and procedures in effect at the time of the resubmittal. EPA may require additional testing and/or different test methods than were used in the original trial burns, based upon changes in policy and guidance.

#### **VII.B.2. TRIAL BURN POHCs**

The principal organic hazardous constituents (POHCs) for which DREs must be determined for the RM-17 Incinerator are:

<b><u>Waste Feed:</u></b>	<b><u>POHC:</u></b>
Toluene Recycle	Toluene
Light Ends	Toluene

The principal organic hazardous constituents (POHCs) for which DREs must be determined for the CO Boilers are:

Waste Feed:	POHC:
DAF Float	Toluene
Sulfinol Reclaimer Bottoms	Toluene

Additional, or different, POHCs may be selected if the Director determines it is appropriate to do so. If additional or different POHC's are selected, based on review of the revised trial burn plan, the trial burn schedule (for a particular unit) specified in Permit Condition VII.E may be postponed for ninety days from the date of POHC designation by the Director.

VII.B.3. TRIAL BURN DETERMINATIONS

During the trial burn (or as soon after the trial burn as practicable), the Permittee shall make the determinations required by 40 CFR § 270.62(b)(6)(i)-(ix).

VII.B.4. TRIAL BURN DATA SUBMISSIONS AND CERTIFICATIONS

The Permittee shall submit a copy of all data collected during the trial burn to the Director upon completion of the burn. The Permittee shall submit to the Director the results of the determinations required by Condition VII.B.3 within ninety (90) days of the completion of the trial burn. All submissions must be certified in accordance with 40 CFR § 270.11. [40 CFR § 270.62(b)(7) and (9)]

VII.C. REPORTING NON-COMPLIANCE DURING THE TRIAL BURN

If based upon the analytical results of the trial burn and before submitting the required trial burn results, the Permittee determines that the incinerator failed to achieve any of the performance standards specified in 40 CFR § 264.343, the Permittee shall notify the Director within twenty-four (24) hours of making the determination. Upon the request of the Director, the Permittee shall cease feeding hazardous waste to the incinerator. The Permittee may apply to the Director for a permit modification pursuant to 40 CFR § 270.41 and for a new trial burn pursuant to 40 CFR § 270.62(b).

VII.D. COMPLIANCE SCHEDULE

The Permittee shall provide information to the Director demonstrating compliance with the following items and time schedule for their completion:

Item	Date Due to the Director
1. Submit revised trial burn plan for CO Boiler 2	January 15, 1991
2. Conduct a trial burn on CO Boiler 2.	July 15, 1991
3. Submit trial burn report for CO Boiler 2.	November 1, 1991
4. Submit revised trial burn plan for CO Boiler 3	January 15, 1993
5. Conduct a trial burn on CO Boiler 3.	July 15, 1993
6. Submit trial burn report for CO Boiler 3.	November 1, 1993
7. Submit revised trial burn plan for RM-17	March 1, 1993
8. Conduct a trial burn on RM-17.	September 1, 1993
9. Submit trial burn report for RM-17.	December 15, 1993



## SECTION - VIII CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS - SCHEDULE OF COMPLIANCE

### STATEMENT OF PURPOSE

This Permit Section directs the Permittee (1) to perform a RCRA Facility Investigation (RFI) to determine fully the nature and extent of any release of hazardous wastes and hazardous constituents at or from the Facility, and (2) to perform a Corrective Measure Study (CMS) to identify and evaluate alternatives for corrective action necessary to prevent or mitigate any migration or releases of hazardous wastes or hazardous constituents at or from the Facility. This section will replace the March 6, 1989 §3008(h) Corrective Action Order.

### VIII.A. SUMMARY OF FINDINGS & RFA RESULTS

VIII.A.1. In its Part A permit application, dated November 12, 1980, and in its Notification of Hazardous Waste Activity, dated July 22, 1980, Permittee identified itself as handling the following hazardous wastes at the Facility:

- VIII.A.1a. Hazardous wastes that exhibit the characteristic of ignitability, identified at 40 C.F.R. §261.21 (D001).
- VIII.A.1b. Hazardous wastes that exhibit the characteristic of corrosivity, identified at 40 C.F.R. §261.22 (D002).
- VIII.A.1c. Hazardous wastes that exhibit the characteristic of reactivity, identified at 40 C.F.R. §261.23 (D003).
- VIII.A.1d. Hazardous wastes containing spent non-halogenated solvents from non-specific sources, as identified at 40 C.F.R. §261.31 (F003).
- VIII.A.1e. Hazardous wastes containing dissolved air flotation float from the petroleum refining industry, identified at 40 C.F.R. §261.32 (K048).
- VIII.A.1f. Hazardous wastes containing slop oil emulsion solids from the petroleum refining industry, identified at 40 C.F.R. §261.32 (K049).
- VIII.A.1g. Hazardous wastes containing heat exchanger bundle cleaning sludge from the petroleum refining industry, identified at 40 C.F.R. §261.32 (K050).
- VIII.A.1h. Hazardous waste containing API separator sludge from the petroleum refining industry, identified at 40 C.F.R. §261.32 (K051).
- VIII.A.1i. Hazardous waste containing tank bottoms (leaded) from the petroleum refining industry, identified at 40 C.F.R. §261.32 (K052).
- VIII.A.1j. Commercial chemical products, manufacturing chemical intermediates, off-specification commercial chemical products, or chemical intermediates identified at 40 C.F.R. Section 261.33(e) (P053, P110).

- VIII.A.1k Commercial chemical products, manufacturing chemical intermediates, off-specification commercial chemical products, or chemical intermediates identified at 40 C.F.R. Section 261.33(f) (U013, U052, U056, U122, U125, U031, U188, U220, U239, U140, U154, U159).

VIII.A.2. On or about April 14, 1987, Permittee modified the Part A permit application for the Facility. In the revised Part A, Permittee identified treatment and storage of the following wastes at the Facility:

- VIII.A.2a. Hazardous wastes that exhibit the characteristic of EP Toxicity for Chromium, identified at 40 C.F.R. §261.24 (D007).
- VIII.A.2b. Hazardous wastes containing spent non-halogenated solvents from non-specific sources, as identified at 40 C.F.R. §261.31 (F005).
- VIII.A.2c. Hazardous wastes containing dissolved air flotation float from the petroleum refining industry, identified at 40 C.F.R. §261.32 (K048).

### VIII.A.3. Facility Description

(Unless otherwise noted, information in this Section and in Sections VIII.A.4 and VIII.A.5 is from the "RCRA Facility Assessment Report, Shell Oil Company Martinez Manufacturing Complex" completed by A.T. Kearney for EPA, February, 1988. Hereinafter, this report will be referred to as the "RFA Report." The RFA Report is based on information found in the RCRA files and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) files of EPA Region 9, files and reports of the California Department of Health Services (DHS), and files and reports of the San Francisco Region of the California Regional Water Quality Control Board (RWQCB). The RFA Report contains information collected during records review, data evaluation, interviews, and a visual site inspection (VSI) performed November 11, 12, and 13, 1987 to evaluate the potential for releases of hazardous constituents from solid waste management units and areas of concern at the Facility.)

- VIII.A.3a. Operational History: The Facility was established at its present location in 1913 with a product terminal. In 1916, Permittee commenced refining operations at this site, at which time it processed 20,000 barrels of crude oil per day. In 1931 Permittee constructed a chemical plant at this site for the production of secondary butyl alcohol. Since 1913, Permittee has produced up to 50 different chemicals at the Facility, including alcohols, peroxides, solvents, and catalysts. Currently, most chemical production areas are now inactive and some have been dismantled. Permittee presently continues catalyst production and refining operations at the Facility.
- VIII.A.3b. Facility Location: Permittee owns and operates a petroleum refinery and chemical manufacturing plant located on a 1000-acre site on the south shore of the Carquinez Strait and Suisun Bay, near the city of Martinez (see Figures 1 and 2, attached hereto and incorporated by reference). The areas surrounding the Facility to the west, south, and southeast are generally residential and light industrial. A PG&E power plant is located immediately west of the Facility, and the Mountain View Sanitary District operates a wastewater treatment facility on the eastern edge of the refinery. Undeveloped marshland and open water border the facility to the north and northeast.

- VIII.A.3c. **Products:** The Facility currently maintains a crude-run throughput of 107,400 barrels per day, and manufactures gasoline, intermediate fuels (jet, diesel, stove, kerosene), industrial fuels, spray oils, lubricants, gasoline additives, asphalts, and catalysts.
- VIII.A.3d. **Facility Units:** The Facility consists of crude oil refining process units, several chemical production areas (many of which are currently inactive), hazardous waste transfer and storage areas, oil-water separator systems, and wastewater treatment units. Table 1, attached hereto and incorporated by reference, lists the active and inactive waste management units present at the Facility. The location of each unit is shown in Figures 3 through 11, attached hereto and incorporated by reference. A summary of wastes managed at each unit is given in the RFA report.
- VIII.A.3e. **Topography and Meteorology:** The local topography varies from hilly south of and onto the Facility, to tidal flats north and northeast of the Facility (see Figure 2). In general, the topography slopes from the south to the north in the direction of the Carquinez Strait. The climate in the area around the Facility is mild, with an average high temperature in August of 70 degrees Fahrenheit and an average low in January of 42 degrees. Average annual rainfall is 18 inches, with most precipitation occurring between November and February. Less than 10% of the precipitation recharges the groundwater, with the remainder forming surface run-off. However, man-made topographic features (e.g. ponds and dikes) may influence local groundwater recharge.
- VIII.A.3f. **Surface Water and Floodplain:** The Facility is divided into two watersheds. Surface and process waters in the west watershed are collected by the sewer system which drains to the effluent treating area north of Marina Vista Boulevard (see Figure 2). Process waste waters in the east watershed are discharged to the gross oil separator and then pumped to the west watershed for additional treatment. Storm (surface) water in the east watershed is diverted to storm ponds equipped with oil baffles and weirs. After separation, the water is discharged through ditches, eventually entering Suisun Bay at Bulls Head Point.
- VIII.A.3g. **Geology and Hydrogeology:** The Facility is located within the San Francisco Bay Hydrologic Study Area and is bounded on the east by the Ygnacio Valley Groundwater Basin and on the west by the Arroyo del Hambre Groundwater Basin. Due to the limited occurrence of groundwater beneath the Facility, the area is not designated as a groundwater basin. Several unnamed aquifers occur beneath the Facility, but are limited in water yield and areal extent. Groundwater beneath the Facility occurs in several modes, including: 1) in interconnected pores and fractures within the bedrock hills, 2) temporarily or seasonally within alluvial deposits and localized fill which overlies the bedrock, 3) within unconsolidated alluvial fill which blankets the lower elevations, and 4) within the pore spaces of the low permeability bay muds which occur near the Carquinez Strait and Suisun Bay. Groundwater beneath the Facility, both shallow and deep, is brackish and limited in available economic quantities. Therefore, groundwater is not utilized as a domestic or industrial supply source. However, the groundwater basins which border the Facility on the east and west are used as water supply sources.

Groundwater beneath the site is recharged primarily from the surrounding hills. Water percolates downward through the pore spaces and fractures until it reaches the water table where the flow is then governed by hydraulic gradients as the water moves to areas of lower potential at the base of the hills. Many of the unconsolidated alluvial sediments which occur at the bases of the hills are less permeable than the bedrock of the hills and retard the flow of groundwater. As recharging groundwater from the bedrock encounters the less permeable alluvial sediments a mounding of groundwater occurs. During periods of high rainfall, water level fluctuations of over 25 feet have been observed in some wells and in the presence of seeps along the flanks of the hills. Groundwater within the alluvial sediments discharges to ponds, creeks, and marshlands in and surrounding the Facility as well as to Carquinez Strait and Suisun Bay. Groundwater flowing beneath the western property line of the Facility discharges to the Arroyo Hambre Groundwater Basin, whereas groundwater flowing east from the Facility discharges to the Ygnacio Valley Groundwater Basin. Groundwater which flows north from the central portion of the refinery complex discharges to Carquinez Strait.

VIII.A.3h. Groundwater Monitoring: As part of prior site investigation efforts and ongoing quarterly groundwater monitoring, Permittee has drilled numerous groundwater monitoring wells at the Facility. The locations of these wells are shown in Figures 12 and 13, attached hereto and incorporated by reference.

VIII.A.3i. Recent Regulatory Activities: In 1983 the California Regional Water Quality Control Board (RWQCB) issued a Waste Discharge Permit to Permittee for operation of three sludge drying ponds (Unit 4.1). Pursuant to the Permit requirements, Permittee began a site characterization study of this unit in 1984.

To address the California Water Code Calderon Requirements (Division 7, Chapter 4, Article 4, Section 13273), Permittee has initiated an environmental monitoring program for 17 inactive waste disposal units which it used to dispose of process-generated refinery wastes. These activities are overseen by RWQCB. Permittee submitted a Solid Waste Assessment Test (SWAT) report on these activities to RWQCB in June, 1987.

Permittee also submitted to RWQCB in August, 1987 a Report of Waste Discharge which examined the effects of 16 land disposal units on groundwater quality. Permittee further conducted a surface impoundment sampling and analysis study to determine if the wastewater treatment ponds and stormwater ponds were subject to the California Toxic Pits Cleanup Act of 1985. Permittee submitted this report to RWQCB in June, 1987. Permittee currently performs quarterly groundwater monitoring at the Facility.

Permittee submitted a Part B permit application to DHS and EPA in 1983 for operation of a hazardous waste incinerator (Unit 4.55) at the Facility. Permittee modified the Part B permit application in 1986 to include three carbon monoxide boilers (Unit 4.49) and associated tanks (Units 4.47 and 4.48) for waste disposal.

#### VIII.A.4. Documentation of Releases

##### VIII.A.4a. Soils:

Unit 4.1: An investigation by Permittee in response to Waste Discharge Permit requirements found elevated levels of chromium in soils along the western and southern perimeter of Unit 4.1 (Land Treatment Area "FF"). In addition, soil borings also showed high concentrations of petroleum hydrocarbons along the western side of the unit, indicating the further release of wastes from this unit. This area is now the location of stormwater retention ponds (Unit 4.66). Chromium is a hazardous constituent identified at 40 C.F.R. §261 Appendix VIII.

Units 4.2, 4.4, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14, 4.16, and 4.17: As part of site investigation efforts in 1986, Permittee sampled soils underneath several units at the Facility. Soil samples were taken at depths ranging from 5.5 to 46.5 feet. Soils underneath the following units were found to have elevated levels of barium, chromium, nickel, and lead:

- 4.2 Inactive Unit "H"
- 4.4 Inactive Unit "L"
- 4.6 Landfill Area "M"
- 4.7 Landfill Area "O"
- 4.8 Land Disposal Area "Q"
- 4.9 Open Burning and Landfill Area
- 4.10 Land Disposal Area "X"
- 4.11 Impoundment "Y"
- 4.12 Landfill Area "Z"
- 4.13 Pond Area "AA"
- 4.14 Land Disposal Area "DD"
- 4.16 Oily Water Sump "N"
- 4.17 Oily Water Sump "K"

Barium, chromium, nickel, and lead are hazardous constituents identified at 40 C.F.R. §261 Appendix VIII.

Unit 4.4: During the Visual Site Inspection (VSI) for the RCRA Facility Assessment, a seep was observed at the toe of the containment dam where the dam at Unit 4.4 (Inactive Unit "L") intersects the water table. EPA believes this seep contains hydrocarbons and tetraethyl lead, which are components of wastes managed at this unit. Tetraethyl lead is a hazardous constituent identified at 40 C.F.R. §261 Appendix VIII.

Unit 4.15: Unit 4.15 (Ballast Water Pond) received ship ballast containing heavy metals and complex hydrocarbons. Crude oil and fuel hydrocarbons contain benzene, a hazardous constituent identified at 40 C.F.R. §261 Appendix VIII. During the VSI, oily sludges were observed in the unit. EPA believes that the oily sludges observed in the unit contain benzene and may contain other hazardous constituents identified at 40 C.F.R. §261 Appendix VIII. The unit is not covered, nor does it have a liner underneath. Since the unit contained liquids and is not lined, EPA believes that hazardous constituents from materials in the unit have migrated from the unit into the soils beneath the unit.

- Unit 4.32: Unit 4.32 (Biotreater Equalization Feed Ponds, Unit "D") receives wastewater from the final pH adjustment unit (Unit 4.31). Wastewater in this unit contains the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: antimony, barium, chromium, dimethylphenol, naphthalene, and phenol. Sediments at this unit contain the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, barium, chromium, lead, nickel, mercury, silver, benzene, chrysene, and naphthalene. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.
- Unit 4.33: Wastewater in Unit 4.33 (Emergency Waste-water Holding Ponds, Unit "C") contains the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: nickel, selenium, silver, toluene, aniline, 2,4-dimethylphenol, naphthalene, and phenol. Sediments at this unit contain the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, barium, chromium, lead, nickel, mercury, silver, benzene, toluene, benzo(a)pyrene, chrysene, 2-chloronaphthalene, fluoranthene, and naphthalene. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.
- Unit 4.34: Wastewater in Unit 4.34 (Activated Sludge Biotreater) contains the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: cadmium, selenium, thallium, and phenol. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.
- Unit 4.38: Wastewater in Unit 4.38 (Sand Filter Feed Pond) contains the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: chromium, nickel, lead, selenium, and silver. Sediments at this unit contain the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, chromium, mercury, nickel, selenium, and silver. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.
- Unit 4.40: Wastewater in Unit 4.40 (Final Holding Pond) contains the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: chromium, nickel, and silver. Sediments at this unit contain the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, barium, chromium, lead, mercury, nickel, and selenium. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.
- Unit 4.57: Unit 4.57 (PG&E Sludge Terraces) contains sludges with high pH (8.5-9.0) and the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, barium, cadmium, chromium, nickel, and selenium. The unit is unlined, and rainwater falls on wastes in the unit. EPA believes that rainwater percolating through the sludge in the unit has leached heavy metal hazardous constituents from the sludge and carried them into the soils underlying the unit.

Unit 4.63: Wastewater in Unit 4.63 (Stormwater Holding Pond) contains the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: selenium, silver, benzene, toluene, aniline, chrysene, 2,4-dimethylphenol, naphthalene, and phenol. Sediments at this unit contain the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, barium, chromium, lead, nickel, mercury, selenium, silver, toluene, chrysene, phenol, and naphthalene. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.

Unit 4.66: Sediments in Unit 4.66 (Stormwater Holding Ponds - Formerly Land Treatment Area "FF") contain the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, barium, chromium, lead, mercury, nickel, silver, and toluene. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.

Units 4.67 and 4.68: Pursuant to Solid Waste Assessment Test requirements, Permittee tested soils 2.5 to 5.5 feet underneath Unit 4.67 (Inactive Unit "YY") and 5 to 15 feet underneath Unit 4.68 (Inactive Unit "ZZ"). Barium, chromium, nickel, lead, and thallium were found in soils underneath both units. Barium, chromium, nickel, lead, and thallium are hazardous constituents as identified at 40 C.F.R. §261 Appendix VIII.

VIII.A.4b. Groundwater:

Facility: In 1987, Permittee conducted quarterly groundwater monitoring of 159 wells at the Facility for water level measurements and sampled 59 wells at the Facility for metals, Total Organic Carbon (TOC), benzene, toluene, xylene, sulfate, total phosphorous, and ammonia. According to the "Quarterly Groundwater Monitoring Report for Shell Oil Company Martinez Manufacturing Complex" prepared by EMCON Associates and submitted to RWQCB in September, 1987, third quarter monitoring showed widespread groundwater contamination (benzene, toluene, nickel, lead, xylene/ethylbenzene) in several geologic units underlying the Facility. This information is summarized in Table 2, attached hereto and incorporated by reference. Benzene, toluene, lead, and nickel are hazardous constituents identified at 40 C.F.R. §261 Appendix VIII.

In addition, the RFA Report and EMCON's 1987 third quarterly monitoring data also have identified several areas of groundwater overlain with plumes of hydrocarbon material. These include two larger plumes and four smaller size plumes. (See Table 2 for a list of wells containing overlying hydrocarbon, and Figures 12 and 13 for the location of these wells.) One of the larger plumes, located approximately in the center of the refinery between Reservoirs #1 and #2 and Lake Slobodnick (Figure 7 and 8), contains approximately 15,000 barrels of crude oil, while the other large plume, located under Crude Hill (Figure 6), contains at least 5000 barrels of jet fuel. Crude oil and jet fuel both contain benzene, a hazardous constituent identified at 40 C.F.R. §261 Appendix VIII.

Units 4.9, 4.11, 4.12 and 4.13: Elevated levels of acetone and 1,2-dichloropropane have been detected in groundwater (well 177) down gradient of Unit 4.9 (Open Burning and Landfill area), elevated levels of phenols have been

detected in groundwater (well 66) near Unit 4.11 (Impoundment "Y"), elevated levels of nickel have been detected in groundwater (well 148) down gradient of Unit 4.12 (Inactive Landfill "Z"), and elevated levels of nickel have been detected in groundwater (well 90) near Unit 4.13 (Inactive Pond Area "AA"). Acetone, phenol, nickel and 1,2-dichloropropane are hazardous constituents identified at 40 C.F.R. §261 Appendix VIII.

Units 4.32, 4.33, 4.38, 4.38, 4.40, and 4.63: These units are all part of the wastewater treatment system at the Facility (see Figure 3). The units contain liquids but have no underlying liners to retard the migration of wastes from the units to the underlying soils and groundwater (see Paragraph 8.a.). Groundwater samples taken during Quarterly Groundwater Monitoring in 1987 show that samples from wells down gradient of these units have elevated levels of lead, benzene, and xylenes compared to wells up gradient of the units. These compounds have also been identified in wastewater and sediments in these units. Lead and benzene are hazardous constituents identified at 40 C.F.R. §261 Appendix VIII.

VIII.A.4c. Surface Water:

Unit 4.1: Sludge in Unit 4.1 (Inactive Land Treatment Area "FF") has been found to contain nickel and lead, which are hazardous constituents identified at 40 C.F.R. §261 Appendix VIII. Since the unit is located in marshland and portions of the containment dikes have been constructed from permeable material, EPA believes that hazardous constituents have escaped from this unit and have contaminated the marshland.

Unit 4.57: Sludge in Unit 4.57 (PG&E sludge terrace) contains arsenic, cadmium, chromium, nickel, and selenium, which are hazardous constituents identified at 40 C.F.R. §261 Appendix VIII. The terraces are unlined and have no storm water run-off control. EPA believes that uncontrolled run-off from this unit has released to surface water metals which are Appendix VIII hazardous constituents.

VIII.A.4d. Air:

Unit 4.32: Unit 4.32 (Biotreater Equalization Pond) has been shown to contain the following volatile organic compounds which have also been identified at 40 C.F.R. §261 Appendix VIII: toluene, 2,4-dimethylphenol, naphthalene, and phenol. This unit is open and aerated, and, therefore, EPA believes that volatile hazardous constituents have been released from this unit to the air.

VIII.A.5. Releases of hazardous constituents to the soil are likely to continue due to water percolating through the soils and carrying hazardous constituents into the underlying groundwater, since the depth to underlying groundwater is small. According to the 1987 Quarterly Groundwater Monitoring Report, at many locations the groundwater is less than 5 feet below the surface.

Although groundwater under the Facility is generally of poor quality and is not used for industrial or domestic purposes, contaminated groundwater under the Facility can impact surrounding bodies of groundwater and surface water. Since the Facility is located on a groundwater divide, groundwater contamination under the Facility can migrate in several directions and impact groundwater and surface water bodies. Groundwater contamination moving east could contaminate the Ygnacio Valley Groundwater Basin, which is used as a water supply source.



Groundwater contamination moving west could contaminate the Arroyo del Hambre Groundwater Basin, which is also used as a public water supply.

In addition, groundwater from the central part of the Facility flows north to the nearby Carquinez Strait and Suisun Bay, which are used for recreational purposes including boating, fishing, and swimming. Since the Facility is located on the shore of the Carquinez Strait, contaminated storm-water surface run-off from the Facility may also impact the Strait.

VIII.A.6. The hazardous constituents identified in Section VIII.A.4, above, have impacts on human health. According to "Chemical, Physical, and Biological Properties of Compounds Present at Hazardous Waste Sites, Final Report" prepared by Clement Associates (September, 1985), Chromium VI compounds have been found to be carcinogenic in rats and can cause DNA and chromosome damage in animals and humans; soluble barium salts are highly toxic after acute exposure; epidemiological evidence has shown an excess of lung and nasal cancers for workers at nickel refineries; exposure to lead has been shown to cause kidney damage, anemia, and central nervous system damage; acute exposure to toluene causes depression and potential damage to the central nervous system; 1,2-dichloropropane has been shown to cause adenomas and carcinomas in rats and has been found to be mutagenic according to the Ames assay; subchronic exposure to phenol caused liver, kidney, heart, and lung damage in animal tests. According to the Superfund Public Health Evaluation Manual, benzene is a human carcinogen by ingestion or inhalation, and chrysene and benzo(a)pyrene are probable human carcinogens by ingestion or inhalation.

VIII.A.7. Contamination in soils at the Facility are likely to cause continuing contamination of the groundwater. Existing and continuing contamination of the groundwater presents a potential contamination threat to neighboring groundwater basins which are used as public water supplies. This contamination therefore may pose a threat to human health. In addition, contaminated groundwater and storm-water run-off threatens to contaminate and degrade the quality of the Carquinez Strait, Suisun Bay and nearby marshlands. The marshlands are habitat for water fowl. In addition, Suisun Bay is used as a habitat for migratory fish and birds. Recreational uses of Suisun Bay include aesthetic enjoyment and navigation. Releases of hazardous constituents to the air poses a potential threat to the health of Facility workers and people living in residences near the Facility.

#### VIII.B. DEFINITIONS

For purposes of this Corrective Action Schedule of Compliance the following definitions shall apply:

"Facility" means all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA.

"Release" means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

"Solid waste management unit" means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.

"Hazardous waste" means a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or

incapacitating reversible, illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. The term hazardous waste includes hazardous constituent as defined below.

"Hazardous constituent" means any constituent identified in Appendix VIII of 40 CFR Part 261, or any constituent identified in Appendix VIII of 40 CFR Part 264.

#### VIII.C. STANDARD CONDITIONS

- VIII.C.1 Section 3004(u) of RCRA, as amended by HSWA, and 40 CFR § 264.101 require that permits issued after November 8, 1984, address corrective action for releases of hazardous wastes including hazardous constituents from any solid waste management unit (SWMU) at the facility, regardless of when the waste was placed in the unit.
- VIII.C.2 Failure to submit the information required in this Corrective Action Schedule of Compliance, or falsification of any submitted information, is grounds for termination of this Permit (40 CFR § 270.43). The Permittee shall ensure that all plans, reports, notifications, and other submissions to the Director required in this Corrective Action Schedule of Compliance are signed and certified in accordance with 40 CFR § 270.11. Five (5) copies of these plans, reports, notifications or other submissions shall be submitted to the Director and sent by certified mail or hand delivered to:
- U.S. Environmental Protection Agency, Region 9  
Hazardous Waste Management Division  
State Programs Branch, T-2A  
215 Fremont Street  
San Francisco, CA 94105
- VIII.C.3 All plans and schedules required by the conditions of this Corrective Action Schedule of Compliance are, upon approval of the Director, incorporated into this Schedule of Compliance by reference and become an enforceable part of this Permit. Any noncompliance with such approved plans and schedules shall be termed noncompliance with this Permit. Extensions of the due dates for submittals may be granted by the Director in accordance with the permit modification processes under 40 CFR § 270.41.
- VIII.C.4 If the Director determines that further actions beyond those provided in this Corrective Action Schedule of Compliance, or changes to that which is stated herein, are warranted, the Director shall modify the Schedule of Compliance either according to procedures in Section VIII.C.3 of this Permit, or according to the permit modification processes under 40 CFR § 270.41.
- VIII.C.5 All raw data, such as laboratory reports, drilling logs, bench-scale or pilot-scale data, and other supporting information gathered or generated during activities undertaken pursuant to this Corrective Action Schedule of Compliance shall be maintained at the facility [or other location approved by the Director] during the term of this Permit, including any reissued Permits.

#### VIII.D. REPORTING REQUIREMENTS

- VIII.D.1 The Permittee shall submit to the Director signed quarterly progress reports of all activities (i.e., SWMU Assessment, Interim Measures, RCRA Facility Investigation, Corrective Measures Study) conducted pursuant to the provisions of this Corrective Action Schedule of Compliance, beginning no later than ninety (90) calendar days after the Permitted is first required to begin implementation of any requirement herein. These reports shall contain:
- VIII.D.1.a A description of the work completed;
  - VIII.D.1.b Summaries of all findings, including summaries of laboratory data;
  - VIII.D.1.c Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems; and
  - VIII.D.1.d Projected work for the next reporting period.
- VIII.D.2 Copies of other reports (e.g., inspection reports), drilling logs and laboratory data shall be made available to the Director upon request.
- VIII.D.3 As specified under Permit Condition VIII.C.4, the Director may require the Permittee to conduct new or more extensive assessments, investigations, or studies, as needed, based on information provided in these progress reports or other supporting information.

#### VIII.E. NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF NEWLY IDENTIFIED SOLID WASTE MANAGEMENT UNITS(S)

- VIII.E.1 The Permittee shall notify the Director in writing of any newly-identified SWMU(s) (i.e., a unit not specifically identified during the RFA (and listed in Section VIII.A), discovered during the course of ground- water monitoring, field investigations, environmental audits, or other means, no later than fifteen (15) calendar days after discovery.
- VIII.E.2 After such notification, the Director may request, in writing, that the Permittee prepare a Solid Waste Management Unit (SWMU) Assessment Plan and a proposed schedule of implementation and completion of the Plan for any additional SWMU(s) discovered subsequent to the issuance of this Permit.
- VIII.E.3 Within sixty (60) calendar days after receipt of the Director's request for a SWMU Assessment Plan, the Permittee shall prepare a SWMU Assessment Plan for determining past and present operations at the unit, as well as any sampling and analysis of ground water, land surface and subsurface strata, surface water or air, as necessary to determine whether a release of hazardous waste including hazardous constituents from such unit(s) has occurred, is likely to have occurred, or is likely to occur. The SWMU Assessment Plan must demonstrate that the sampling and analysis program, if applicable, is capable of yielding representative samples and must include parameters sufficient to identify migration of hazardous waste including hazardous constituents from the newly- discovered SWMU(s) to the environment.

VIII.E.4 After the Permittee submits the SWMU Assessment Plan, the Director shall either approve or disapprove the Plan in writing.

If the Director approves the Plan, the Permittee shall begin to implement the Plan within fifteen (15) calendar days of receiving such written notification.

If the Director disapproves the Plan, the Director shall either (1) notify the Permittee in writing of the Plan's deficiencies and specify a due date for submittal of a revised Plan, or (2) revise the Plan and notify the Permittee of the revisions. This Director-revised Plan becomes the approved SWMU Assessment Plan. The Permittee shall implement the Plan within fifteen (15) calendar days of receiving written approval.

VIII.E.5 The Permittee shall submit a SWMU Assessment Report to the Director no later than twenty-five (25) calendar days from completion of the work specified in the approved SWMU Assessment Plan. The SWMU Assessment Report shall describe all results obtained from the implementation of the approved SWMU Assessment Plan. At a minimum, the Report shall provide the following information for each newly-identified SWMU:

VIII.E.5.a The location of the newly-identified SWMU in relation to other SWMUs;

VIII.E.5.b The type and function of the unit;

VIII.E.5.c The general dimensions, capacities, and structural description of the unit (supply any available drawings);

VIII.E.5.d The period during which the unit was operated;

VIII.E.5.e The specifics on all wastes that have been or are being managed at the SWMU, to the extent available; and

VIII.E.5.f The results of any sampling and analysis required for the purpose of determining whether releases of hazardous wastes including hazardous constituents have occurred, are occurring, or are likely to occur from the unit.

VIII.E.6 Based on the results of this Report, the Director shall determine the need for further investigations at specific unit(s) covered in the SWMU Assessment. If the Director determines that such investigations are needed, the Director may require the Permittee to prepare a plan for such investigations. This plan will be reviewed for approval as part of the RFI Workplan under Permit Condition VIII.G.1 of this Corrective Action Schedule of Compliance.

#### VIII.F. NOTIFICATION REQUIREMENTS FOR NEWLY-DISCOVERED RELEASES AT SWMUS

The Permittee shall notify the Director, in writing, of any release(s) of hazardous waste including hazardous constituents discovered during the course of ground-water monitoring, field investigation, environmental auditing, or other activities undertaken after the commencement of the

RFI, no later than fifteen (15) calendar days after discovery. Such newly-discovered releases may be from newly-identified units, from units for which, based on the findings of the RFA, the Director had previously determined that no further investigation was necessary, or from units investigated as part of the RFI. The Director may require further investigation of the newly-identified release(s). A plan for such investigation will be reviewed for approval as part of the RFI Workplan under Permit Condition. VIII.G.1.

#### **VIII.G.      WORK TO BE PERFORMED**

Section 3004(u) of RCRA, as amended by HSWA, and 40 CFR § 264.101 require that permits issued after November 8, 1984, address corrective action for releases of hazardous wastes including hazardous constituents from any solid waste management unit (SWMU) at the facility, regardless of when the waste was placed in the unit.

Pursuant to Section 3008(h) of RCRA, 42 U.S.C. Section 6928(h), EPA issued an Order on March 6, 1989, the requirements of which are essentially incorporated herein, under which the Permittee is hereby ordered to perform the following acts in the manner and by the time schedule specified herein.

It is Permittee's position that much of the "work to be performed" sections of the initial March 6, 1989 3008(h) Order and this Permit has been completed pursuant to the Orders of the RWQCB. EPA and Permittee are currently attempting to negotiate a Consent Order pursuant to Section 3008(h) of RCRA. It is the intent of EPA that eventually the permit will fully replace the 3008(h) order and any subsequent orders, decrees, or agreements thereto.

All work undertaken pursuant to Permit Condition VIII.G. shall be performed in a manner consistent with, at a minimum: the attached Scopes of Work, the EPA-approved RCRA Facility Investigation Workplan and Corrective Measures Study Workplan; RCRA and its implementing regulations; and applicable EPA guidance documents. Relevant guidance includes, but is not limited to: the "RCRA Facility Investigation (RFI) Guidance" (EPA 530/SW-87-001), "RCRA Groundwater Monitoring Technical Enforcement Guidance Document" (OSWER Directive 9950.1, September 1986), "Test Methods For Evaluating Solid Waste" (SW-846, November 1986) and "Construction Quality Assurance for Hazardous Waste Land Disposal Facilities" (EPA 530/SW-85-031, July 1986).

#### **VIII.G.1      RCRA FACILITY INVESTIGATION (RFI)**

- a.      The Permittee shall submit to EPA a Workplan for a RCRA Facility Investigation ("RFI Workplan") forty five(45) days after being notified by the Director. The RFI Workplan is subject to approval by EPA and shall be performed in a manner consistent with the generic RFI Scope of Work contained in Permit Attachment 21. Based on the types of releases documented in permit section VIII, EPA believes that all sections of Permit Attachment 21 are applicable to the Facility. Permit Attachment 21 is incorporated by reference as if fully set forth herein.
- b.      The RFI Workplan shall be designed to define the presence, magnitude, extent, direction, and rate of movement of any hazardous wastes or hazardous constituents from the releases documented in Permit Section VIII.A.4 above, entitled "Documentation of Releases." The RFI Workplan shall document the procedures the Permittees shall use to conduct those investigations necessary to: (1) characterize the geology and hydrogeology in and around the Facility; (2) characterize the existence, nature and extent of any groundwater and surface water contamination in and around the

Facility; (3) characterize the existence, nature and extent of any soils contamination in and around the Facility; (4) characterize the existence, nature and extent of any air and subsurface gas contamination; (5) characterize the potential pathways of contaminant migration; (6) characterize the sources of contamination; (7) identify actual or potential receptors; and (8) support the development of alternatives from which a corrective measure will be selected by EPA. A specific schedule for implementation of all activities shall be included in the RFI Workplan.

- c. In accordance with the provisions of Permit Attachment 21 herein, the RFI Workplan shall include: (1) a Project Management Plan; (2) a Data Collection Quality Assurance Plan; (3) a Data Management Plan; (4) a Health and Safety Plan; and (5) a Public Involvement Plan.

#### VIII.G.2 CORRECTIVE MEASURES STUDY

Within thirty (30) days of EPA's written approval of the final RFI report, Permittee shall submit to EPA a Corrective Measures Study (CMS) Workplan. The CMS Workplan and activities conducted pursuant to this Permit Section are subject to approval by EPA and shall be performed in a manner consistent with the Scope of Work for a Corrective Measures Study contained in Permit Attachment 22. Permit Attachment 22 is incorporated by reference as if fully set forth herein.

#### VIII.G.3 CORRECTIVE MEASURES IMPLEMENTATION

Upon EPA's selection of the corrective measure, if Permittee has complied with the terms of this Permit Section, EPA shall provide a ninety (90) day period for negotiation of an administrative order on consent (or a judicial consent decree) for implementation of the selected corrective measure(s). If agreement is not reached during this period, EPA reserves all rights it has to implement the corrective measure or other remedial response and to take any other appropriate actions under RCRA, CERCLA, or any other available legal authority, including the issuance of a unilateral administrative order directing Permittee to implement the corrective measure.

#### VIII.G.4 SUBMISSIONS/AGENCY APPROVAL/ADDITIONAL WORK

- a. EPA will review all draft and final Workplans, and notify Permittee in writing of EPA's approval/disapproval or modification of the Workplan or any part thereof. In the event of a disapproval or modification, EPA shall specify in writing the deficiencies and reasons for disapproval or modification. Within thirty (30) days of the receipt of EPA's disapproval or modification of any Workplan, Permittee shall amend and submit a revised Workplan. EPA approved Workplans shall be deemed incorporated into and part of this Permit Section.
- b. Within thirty (30) days of approval or modification by EPA of any Workplans, Permittee shall commence work and implement the tasks required by the Workplans submitted pursuant to the Scopes of Work contained in Attachments 1 and 2 in accordance with the requirements, specifications and schedules stated in the Workplans as approved or modified by EPA.

- c. Beginning with the month following the effective date of this Permit Section, Permittee shall provide EPA with progress reports for each quarter on the tenth day of the following month of the end of the quarter. The progress reports shall conform to requirements in relevant Scopes of Work contained in Attachments 1 and 2.
- d. Permittee shall provide draft and final RCRA Facility Investigation and Corrective Measure Study reports to EPA in accordance with the schedule contained in this Permit Section and its attachments.
- e. EPA will review all draft or final reports, and notify Permittee in writing of EPA's approval/disapproval or modification of the report or any part thereof. In the event of any disapproval, EPA shall specify in writing the deficiencies and reasons for such disapproval or modification. Within thirty (30) days of receipt of EPA's disapproval or modification of any report, Permittee shall amend and submit a revised report. EPA approved reports shall be deemed incorporated into and part of this Permit Section.
- f. Two (2) copies of all documents, including Workplans, Program Plans, preliminary and final reports, progress reports, and other correspondence to be submitted pursuant to this Permit Section shall be hand delivered or sent by certified mail, return receipt requested, to the Project Coordinators designated pursuant to Permit Condition VIII.M.
- g. All work performed pursuant to this Permit Section shall be under the direction and supervision of a professional engineer or geologist with expertise in hazardous waste site cleanup. Within sixty (60) days from the effective date of this Permit Section Permittee shall notify EPA in writing of the name, title, and qualifications of the engineer or geologist, and of any contractors, subcontractors and their personnel to be used in carrying out the terms of this Permit Section.
- h. EPA may determine that certain tasks, including investigatory work or engineering evaluation, are necessary in addition to the tasks and deliverables included in the RFI Workplan and/or CMS Workplan when new information indicates that such additional work is necessary. EPA shall request in writing that Permittee perform the additional work in this situation and shall specify the basis and reasons for EPA's determination that the additional work is necessary. Within fourteen (14) days after the receipt of such request, Permittee may request a meeting with EPA to discuss the additional work. Within forty-five (45) days after the receipt of such request, Permittee must submit to EPA for approval a revised Workplan. Upon EPA approval of the revised Workplan, Permittee shall perform the additional work EPA has requested according to the revised Workplan. All additional work performed by Permittee under this paragraph shall be performed in a manner consistent with this Permit Section.

#### VIII.H. QUALITY ASSURANCE

Throughout all sample collection and analysis activities, Permittee shall use EPA-approved quality assurance, quality control, and chain-of-custody procedures as specified in the approved Workplans and Scopes of Work. In addition, Permittee shall:

- VIII.H.1. Ensure that laboratories used by Permittee for analyses perform such analyses according to the EPA methods included in the third edition of "Test Methods for Evaluating Solid Waste (SW-846, November 1986) or other methods deemed satisfactory to EPA. If methods other than the EPA methods are to be used, Permittee shall submit all protocols to be used for analyses to EPA for approval sixty (60) days prior to the commencement of analyses.
- VIII.H.2. Ensure that laboratories used by Permittee for analyses participate in a quality assurance/quality control program equivalent to that which is followed by EPA. As part of such a program, and upon request by EPA, such laboratories shall perform analyses of samples provided by EPA to demonstrate the quality of analytical data.
- VIII.H.3. Inform the EPA Project Coordinator thirty (30) days in advance which laboratories will be used by Permittee and ensure that EPA personnel and EPA authorized representatives have reasonable access to the laboratories and personnel used for analyses.
- VIII.H.4. Use the EPA guidance to evaluate all data to be used in the proposed plans required by Permit Condition VIII.E. This evaluation shall be provided to EPA as part of the RFI Workplan and CMS Workplan required by Permit Condition VIII.E, and shall be updated as required by EPA.

#### VIII.I. PUBLIC COMMENT AND PARTICIPATION

- VIII.I.1. Upon approval by EPA of a Corrective Measure Study Final Report, EPA shall make both the RCRA Facility Investigation Final Report (or summary of report) and the Corrective Measure Study Final Report (or summary of report) and a summary of EPA's proposed corrective measure(s) and EPA's justification for proposing selection of that (those) corrective measure(s) available for public review and comment for at least twenty-one (21) days.
- VIII.I.2. Following the public review and comment period, EPA shall notify Permittee of the corrective measure selected by EPA. If the corrective measure recommended in the Corrective Measure Study Final Report is not the corrective measure selected by EPA after consideration of public comments, EPA will inform Permittee in writing of the reasons for such decision, and Permittee shall modify the RFI/CMS as directed to do so by EPA.
- VIII.I.3. The Administrative Record supporting the selection of the corrective measure(s) will be available for public review at the U.S. EPA Region 9 library, Sixth Floor, 215 Fremont Street, San Francisco, California, from 8 a.m. to 4:30 p.m., weekdays.



#### **VIII.J.      ON-SITE AND OFF-SITE ACCESS**

- VIII.J.1.      EPA and/or any EPA representative, including EPA contractors, are authorized to enter and freely move about all property at the Facility during the effective dates of this Permit Section for the purposes of, inter alia: interviewing Facility personnel and contractors; inspecting records, operating logs, and contracts related to the Facility; reviewing the progress of the Permittee in carrying out the terms of this Permit Section; conducting such tests, sampling, or monitoring as EPA or its Project Coordinator deems necessary; using a camera, sound recording, or other documentary type equipment; and verifying the reports and data submitted to EPA by Permittee. Permittee shall permit such persons to inspect and copy all records, files, photographs, documents, and other writings, including all sampling and monitoring data, that pertain to work undertaken pursuant to this Permit Section.
- VIII.J.2.      To the extent that work required by any approved Scopes of Work and/or Workplans prepared pursuant hereto must be done on property not owned or controlled by Permittee, Permittee will use its best efforts to obtain site access agreements from the present owner(s) of such property within sixty (60) days of approval of the plans for which site access is required. Best efforts as used in this Section shall include, at a minimum, a certified letter from Permittee to the present owners of such property requesting access agreements to permit Permittee and EPA and its authorized representatives to access such property. Any such access agreement shall be incorporated by reference into this Permit Section. In the event that agreements for site access are not obtained within sixty (60) days of the effective date of such plans, Permittee shall notify EPA regarding both the lack of and its failure to obtain such agreements within seven (7) days thereafter. In the event that EPA obtains access, Permittee shall undertake EPA approved work on such property.
- VIII.J.3.      Nothing in this section limits or otherwise affects EPA's right of access and entry pursuant to applicable law, including RCRA and CERCLA.

#### **VIII.K.      SAMPLING AND DATA/DOCUMENT AVAILABILITY**

- VIII.K.1.      Permittee shall submit to EPA the results of sampling and/or tests or other data generated by, or on behalf of Permittee, in accordance with the requirements of this Permit Section and its attachments.
- VIII.K.2.      Permittee shall notify EPA at least fourteen (14) days before engaging in any field activities, any well drilling, installation of equipment, or sampling. At the request of EPA, Permittee shall provide or allow EPA or its authorized representative to take split samples of all samples collected by Permittee pursuant to this Permit Section.
- VIII.J.3.      Permittee may assert a business confidentiality claim under 40 CFR 260.2(b) covering all or part of any information submitted to EPA pursuant to this Permit Section. Any assertion of confidentiality shall be adequately substantiated by Permittee when the assertion is made. Information determined to be confidential by EPA shall be disclosed only to the extent permitted by 40 CFR Part 2. If no such confidentiality claim accompanies the information when it is submitted to EPA, it may be made available to the

public by EPA without further notice to Permittee. Physical or analytical data shall not be deemed confidential.

#### **VIII.K.      RECORD PRESERVATION**

Permittee shall preserve, during the life of this Permit and for a minimum of ten (10) years after its termination, all data, records, and documents in its possession or in the possession of its divisions, employees, agents, consultants, contractors, successors and assigns which relate in any way to this Permit Section or to hazardous waste management and/or disposal at the Facility. After ten (10) years, Permittee shall make such records available to EPA for inspection or shall provide copies of any such records to EPA. Permittee shall notify EPA thirty (30) days prior to the destruction of any such records, and shall provide EPA with the opportunity to take possession of any such records.

#### **VIII.M.      PROJECT COORDINATOR**

- VIII.M.1.      Within thirty (30) days of the effective date of this Permit Section, EPA and Permittee shall each designate a Project Coordinator. Permittee shall notify EPA in writing of the Project Coordinator they have selected. Each Project Coordinator shall be responsible for overseeing the implementation of this Permit Section. The EPA Project Coordinator will be EPA's designated representative at the Facility. All communications between Permittee and EPA, and all documents, reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Permit Section, shall be directed through the Project Coordinators.
- VIII.M.2.      Permittee shall provide EPA at least fourteen (14) days written notice prior to changing Project Coordinators.
- VIII.M.3.      If EPA determines that activities in compliance or noncompliance with this Permit Section have caused or may cause a release of hazardous waste, hazardous constituent, or a pollutant or contaminant, or have caused or may cause a threat to human health or the environment, or if EPA determines that Permittee is not capable of undertaking any studies or corrective measures ordered, EPA may order Permittee to stop further implementation of this Permit Section for such period of time as EPA determines may be needed to abate any such releases or threat and/or to undertake any action which EPA determines is necessary to abate such releases or threat.
- VIII.M.4.      The absence of the EPA Project Coordinator from the Facility shall not be cause for the stoppage of work.

#### **VIII.N.      SUBSEQUENT MODIFICATION**

- VIII.N.1.      This Permit Section may be amended by EPA to ensure protection of human health or the environment. Such amendments shall be in writing, shall have as their effective date the date on which they are signed by EPA, and shall be incorporated into this Permit Section.
- VIII.N.2.      Any reports, plans, specifications, schedules, and attachments required by this Permit Section are, upon written approval by EPA, incorporated into this Permit Section. Any non-compliance with such EPA-approved reports, plans, specifications, schedules, and attachments shall be considered a

violation of this Permit and shall subject Permittee to the penalty provisions provided under the Resource Conservation and Recovery Act

- VIII.N.3. No informal advice, guidance, suggestions, or comments by EPA regarding reports, plans, specifications, schedules, and any other written material submitted by Permittee will be construed as relieving Permittee of its obligation to obtain written approval, if and when required by this Permit Section.

VIII.O. TERMINATION AND SATISFACTION

The provisions of this Permit Section shall be deemed satisfied upon Permittee's receipt of written notice from EPA that Permittee has demonstrated, to the satisfaction of EPA, that the terms of this Permit Section, including any additional tasks determined by EPA to be required pursuant to this Permit Section, or any continuing obligation or promises (e.g. Record Retention, Reservation of Rights) have been satisfactorily completed.

**VIII.P.      FACILITY SUBMISSION SUMMARY**

Below is a summary of the planned reporting requirements pursuant to this Schedule of Compliance:

<b>Item</b>	<b>Date Due to the Director</b>
1. Report of qualifications of engineers, geologists, contractors, subcontractors, and personnel used in corrective action work	sixty (60) calendar days after the effective date of the permit
2. Progress reports on all activities	quarterly, no later than ninety (90) calendar days after Permittee is required to begin implementation
3. RFI Workplan for SWMU(s) identified at time of permit issuance	forty-five (45) calendar days after the effective date of the permit
4. Revised RFI Workplan	forty-five (45) calendar days after notification of deficiency
5. RFI Report and Summary Report	sixty (60) calendar days after completion of RFI
6. Revised RFI Report and Summary Report	thirty (30) calendar days after notification of deficiency
7. CMS Plan	forty-five (45) calendar days after notification of requirement to perform CMS
8. Revised CMS Plan	forty-five (45) calendar days after notification of deficiency
9. CMS Report	sixty (60) calendar days after completion of CMS
10. Revised CMS Report	thirty (30) calendar days after notification of deficiency
11. Demonstration of financial assurance	one hundred twenty (120) days after permit modification for remedy

## List of Attachments

<u>Permit Attachment No.</u>	<u>Plan or Document</u> (from the Part B Permit Application)
1	Waste Analysis Plan (Section V from the Part B Permit Application, Volume 1)
2	Security Plan (page VII.5 from the Part B Permit Application, Volume 3)
3	Inspection Activities and Schedule (page VI.13, from the Part B Permit Application, Volume 1, VI.D.8, from each trial burn plan, and Section VIII.D from the Part B Permit Application, Volume 3)
4	Personnel Training Outline (Section IX from the Part B Permit Application, Volume 3)
5	Contingency Plan (Trial Burn Plan for RM-17 Incinerator, Attachment 1, in the Part B Permit Application, Volume 2 and Section X from the Part B Permit Application, Volume 3)
6	Closure Plan (Section XIII from the Part B Permit Application, Volume 3)
7	Closure Cost Estimate (Pages XIII.4, XIII.7, and XIII.8 from the Part B Permit Application, Volume 3)
8	Detailed plans and other information describing secondary containment systems, submitted in response to draft Permit, August 18, 1989
9	<u>Detailed plans and other information describing Tank 12038 (Section VI.C from the Part B Permit Application, Volume 1.)</u>
10	Procedures for preventing spills and overflows from the tanks or containment systems (Compliance Schedule supplement to the Part B Permit Application)
11	Procedures for handling ignitable or reactive waste (Compliance Schedule supplement to the Part B Permit Application)
12	Detailed plans and other information describing secondary containment systems (page VI.B.3. & 4 from the Part B Permit Application, Volume 3)
13	deleted

**List of Attachments (continued)**

<u>Permit Attach- ment No.</u>	<u>Plan or Document</u> (from the Part B Permit Application)
14	Procedures for preventing spills and overflows from the tanks or containment systems (page VI.B.4 from the Part B Permit Application, Volume 3)
15	Design Plans and Specifications for RM-17 Incinerator
16	Description of Automatic Waste Feed Cut-Off Systems (Trial Burn Plan for RM-17 Incinerator, Table 2, page 15, in the Part B Permit Application, Volume 2)
17	List of Allowable Wastes (Section V from the Part B Permit Application, Volume 1)
18	Design Plans and Specifications for CO Boilers
19	Description of Waste Feed Cut-Off Systems (Trial Burn Plan for CO Boiler 1, Table 7, page 21, in the Part B Permit Application, Volume 2)
20	Trial Burn Plans (The Part B Permit Application, Volume 2)
21	Scope of Work for a RCRA Facility Investigation (RFI) at Shell Oil Company, Martinez Manufacturing Complex
22	Scope of Work for Corrective Measure Study at Shell Oil Company, Martinez Manufacturing Complex
23	Procedures for Handling Ignitable, Reactive, or Incompatible Waste

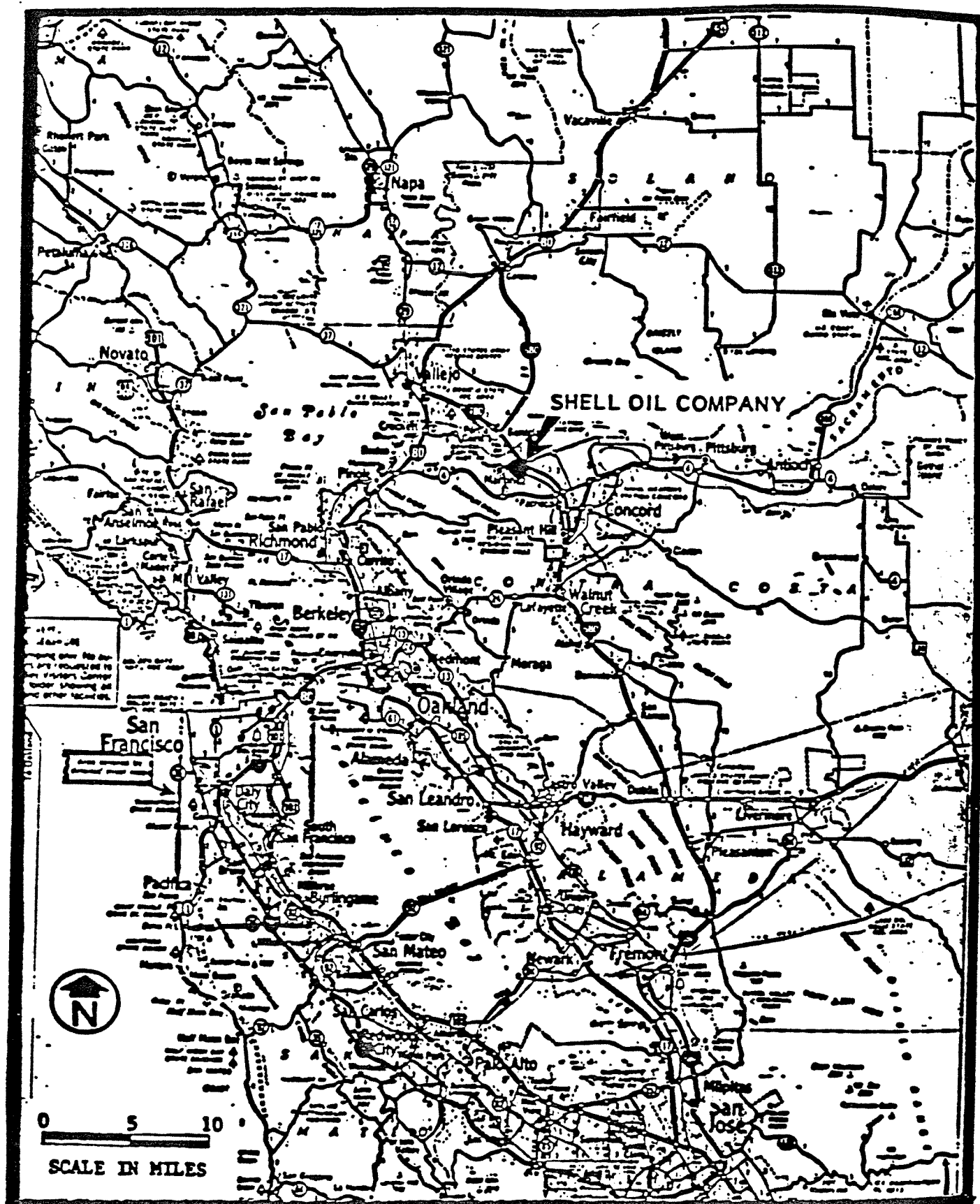


Figure 1

REGIONAL LOCATION OF SHELL OIL  
Base Map: San Francisco Map H.M. Gousha Company

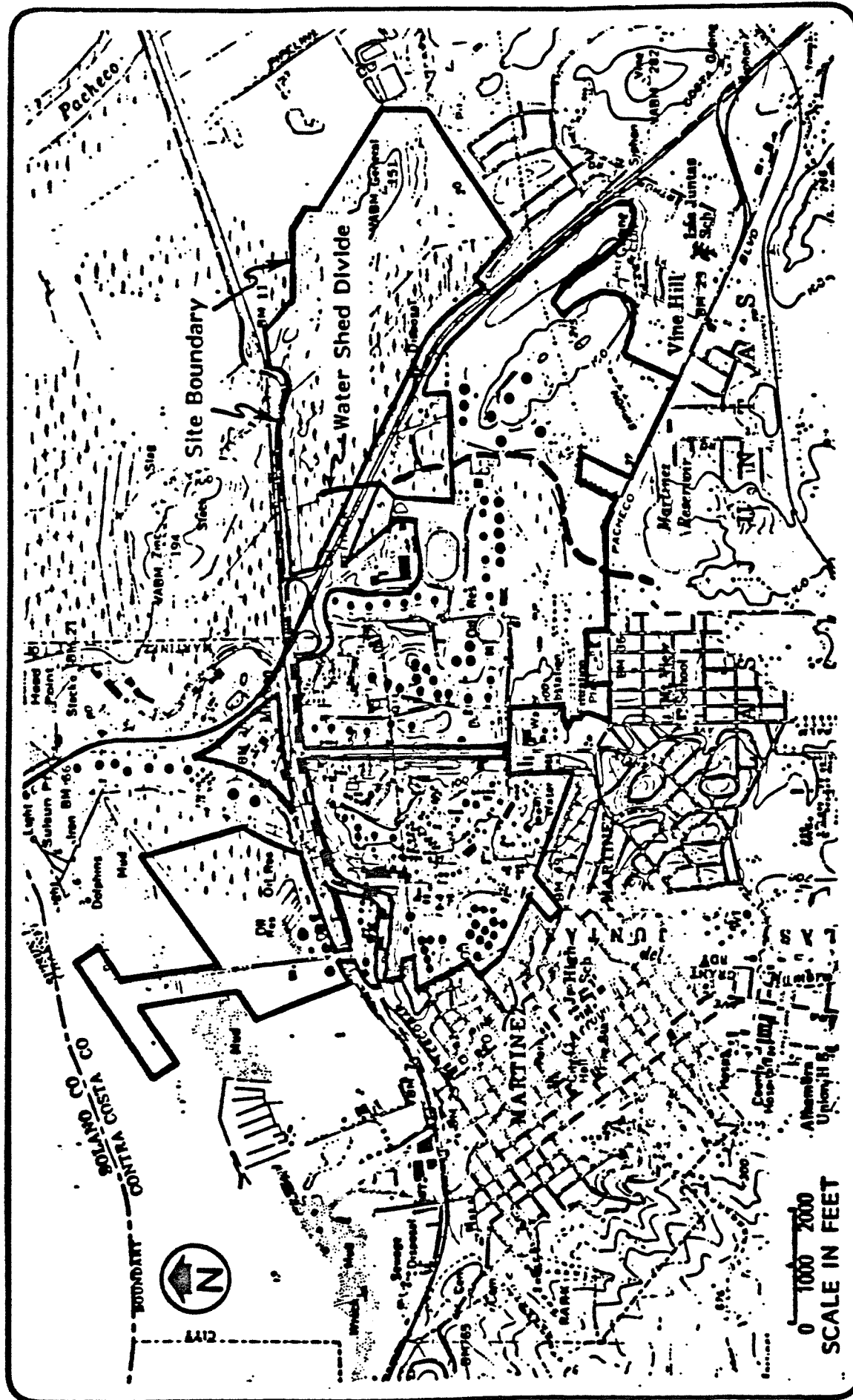
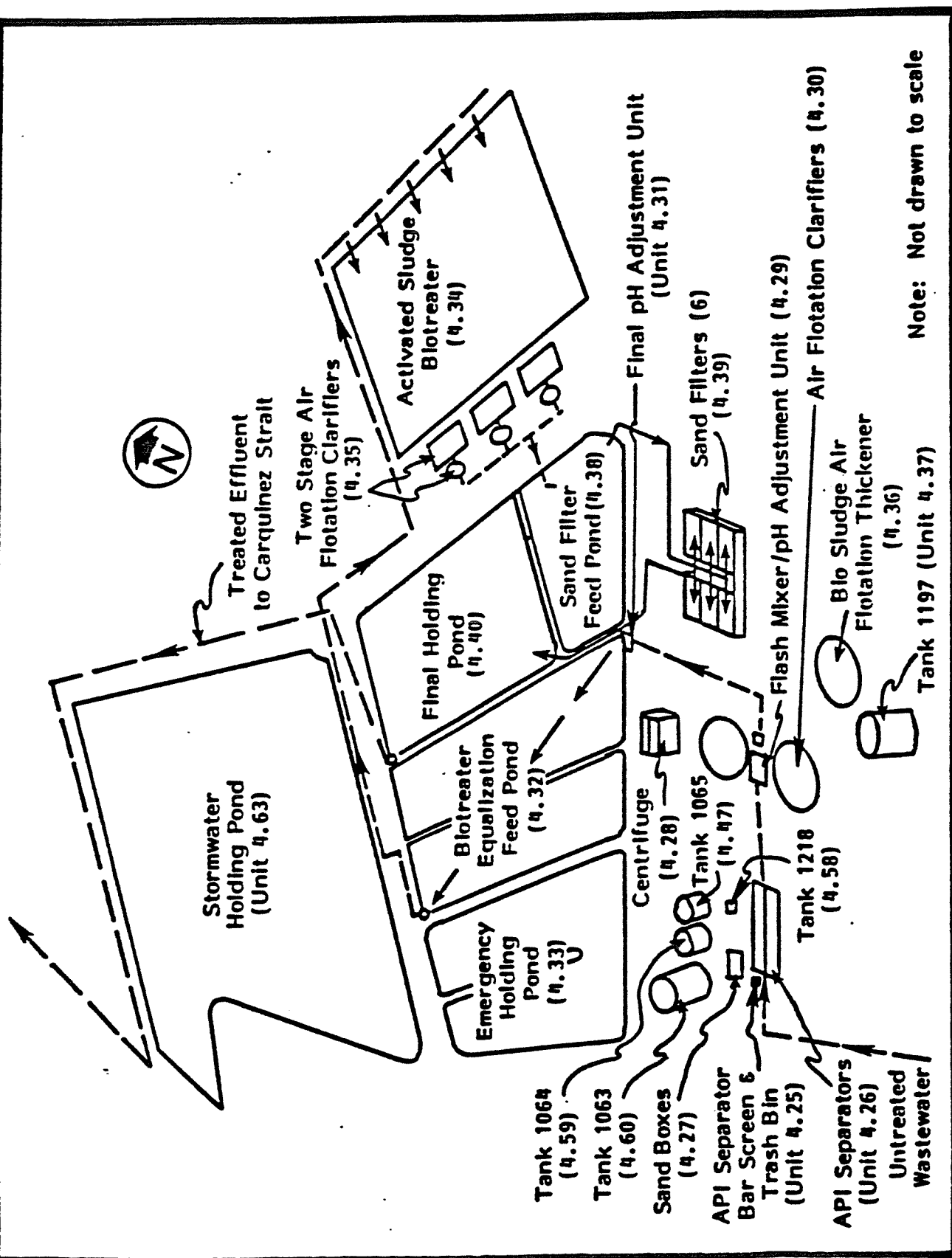


Figure 2

LOCATION MAP OF SHELL OIL COMPANY

Sources: USGS Benicia Quad, 1980 and Port Chicago Quad, 1968



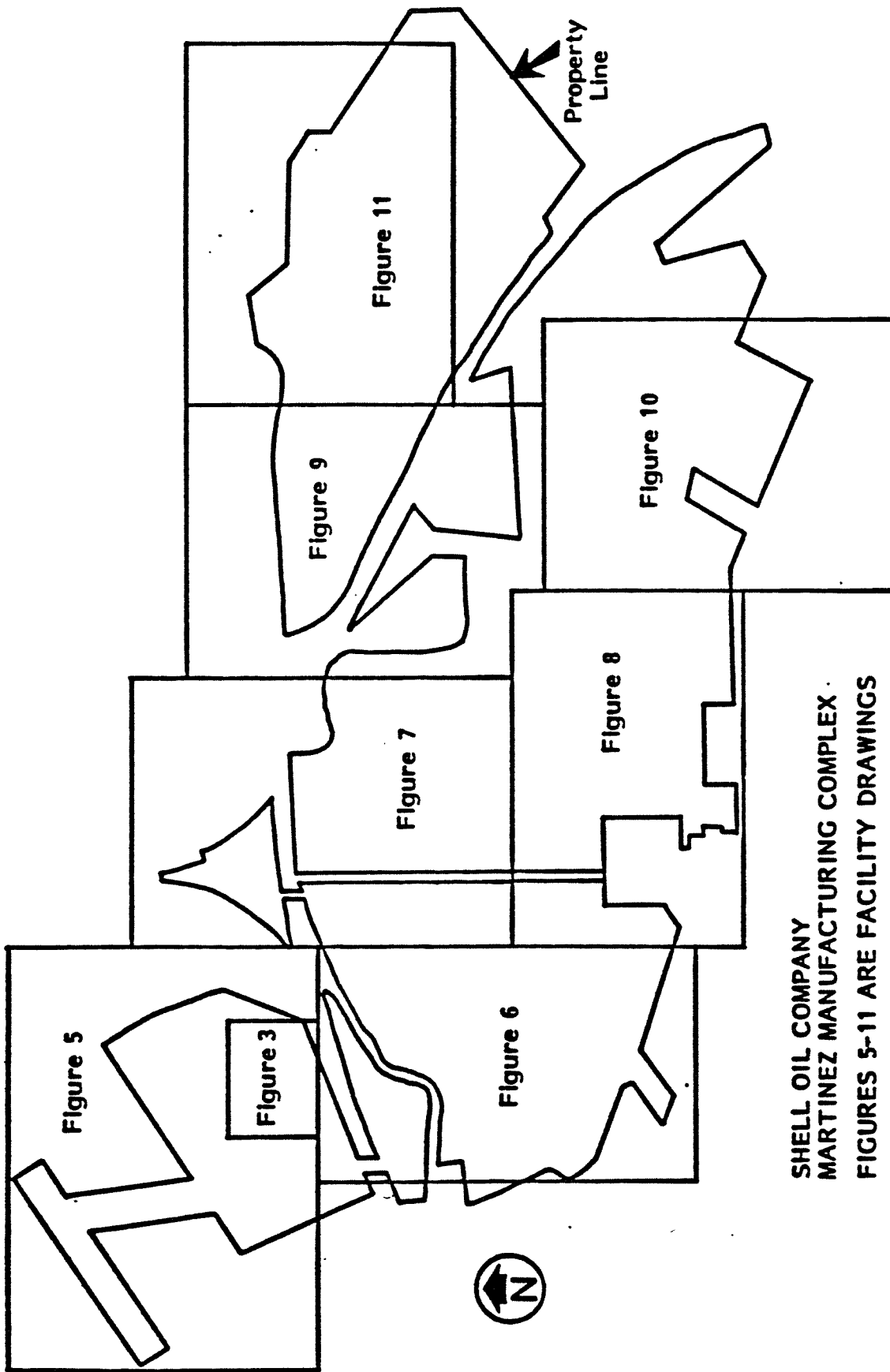


Note: Not drawn to scale

Figure 3

WASTEWATER TREATMENT SYSTEM - SHELL OIL COMPANY

Source: Reference 18 of the RFA Report



SHELL OIL COMPANY  
MARTINEZ MANUFACTURING COMPLEX  
FIGURES 5-11 ARE FACILITY DRAWINGS

Figure 4  
FACILITY INDEX MAP

NOTE: Numbers other than SWMU designations signify tank numbers assigned by the facility.

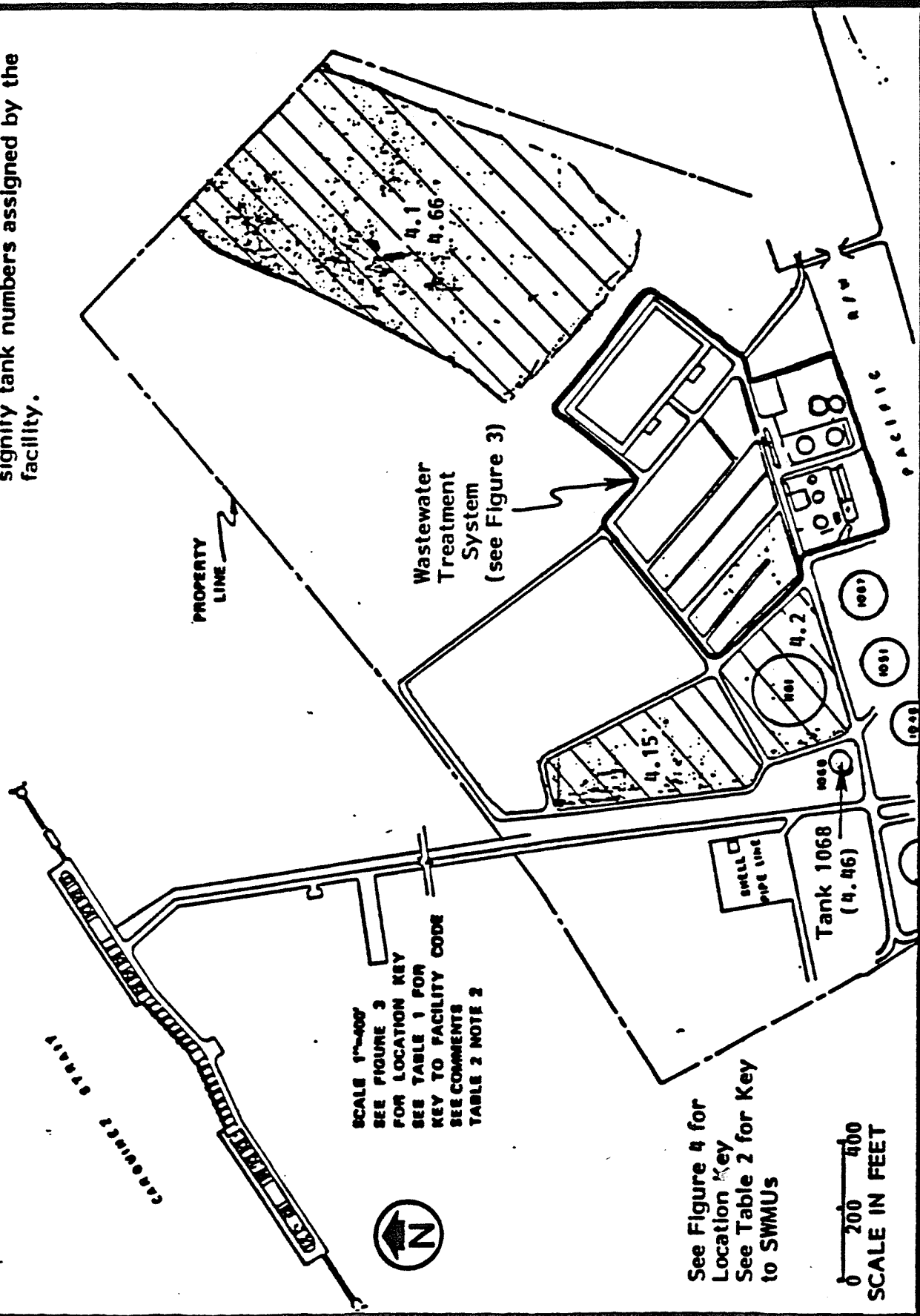


Figure 5

SHELL OIL COMPANY SWMUs

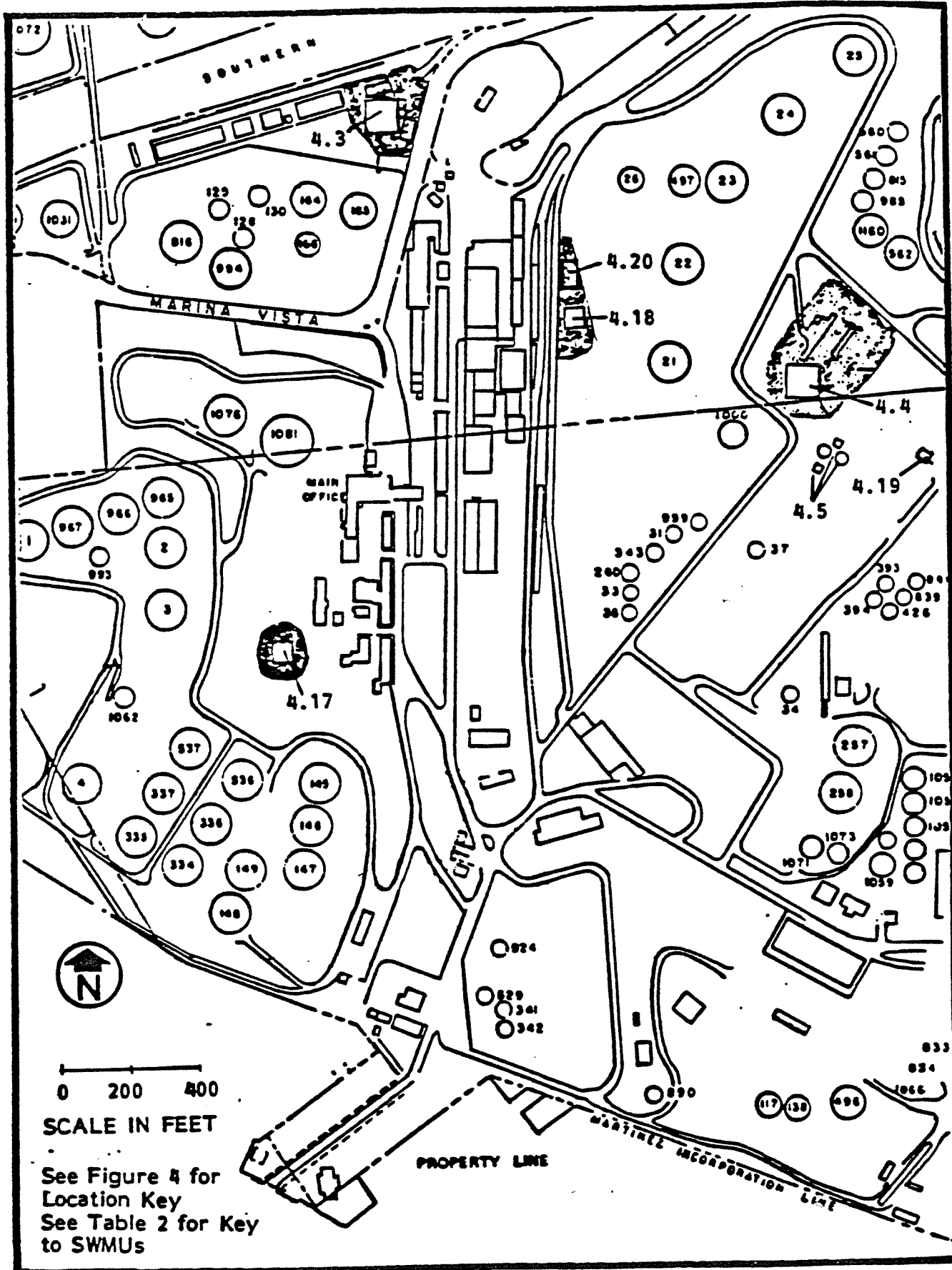


Figure 6  
SHELL OIL COMPANY SWMUs

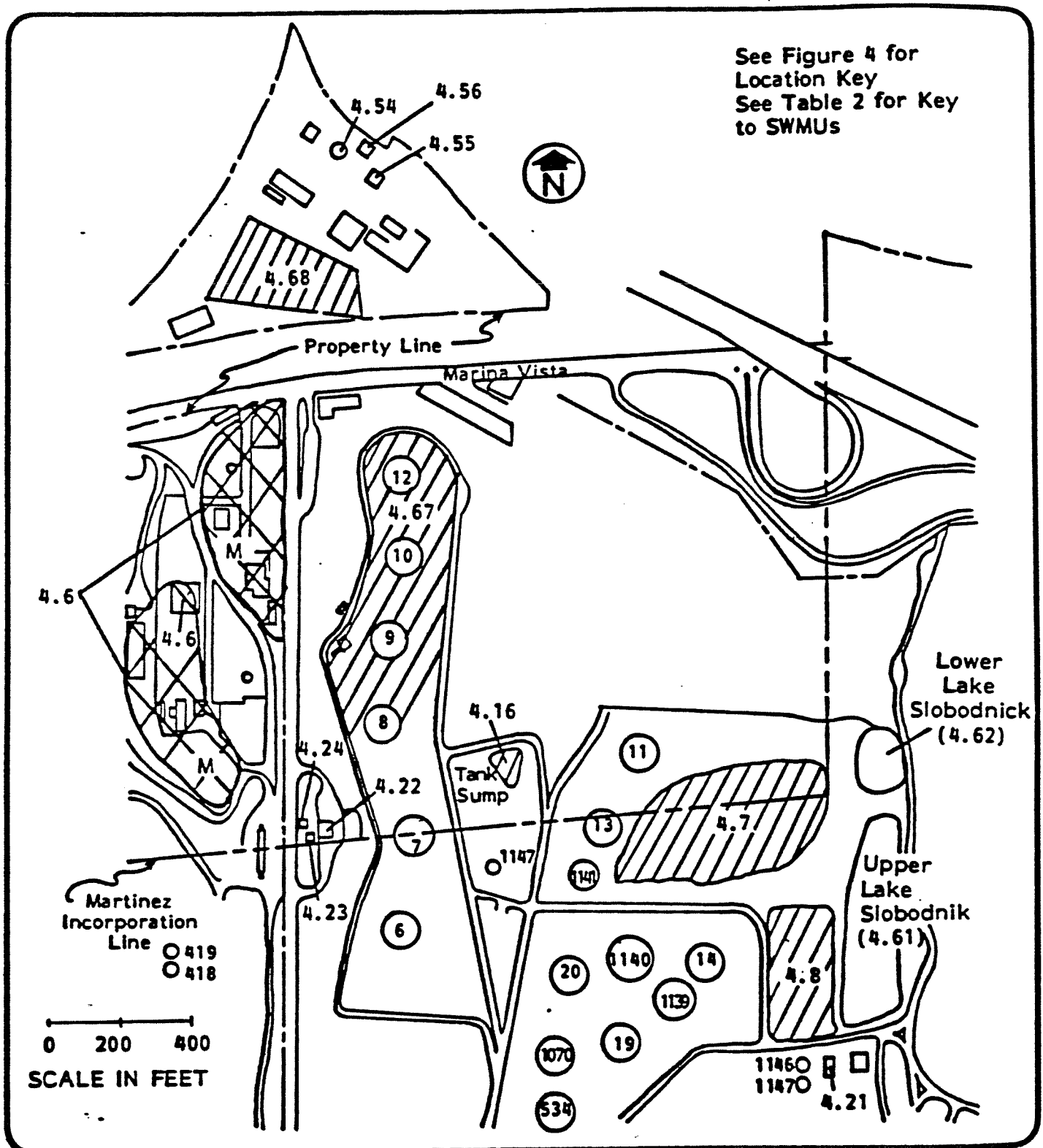


Figure 7

SHELL OIL COMPANY SWMUs

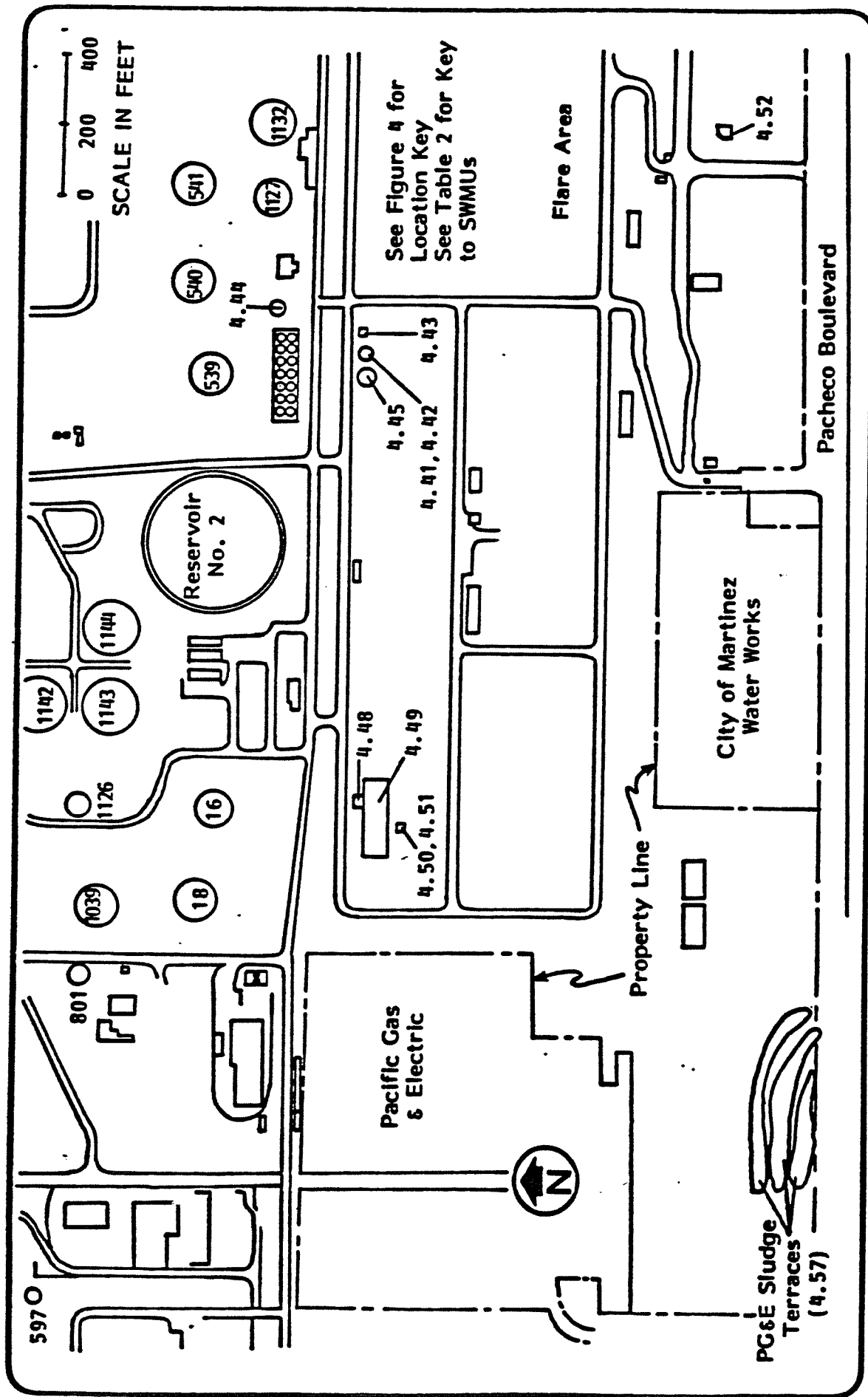


Figure 8

SHELL OIL COMPANY SWMUs

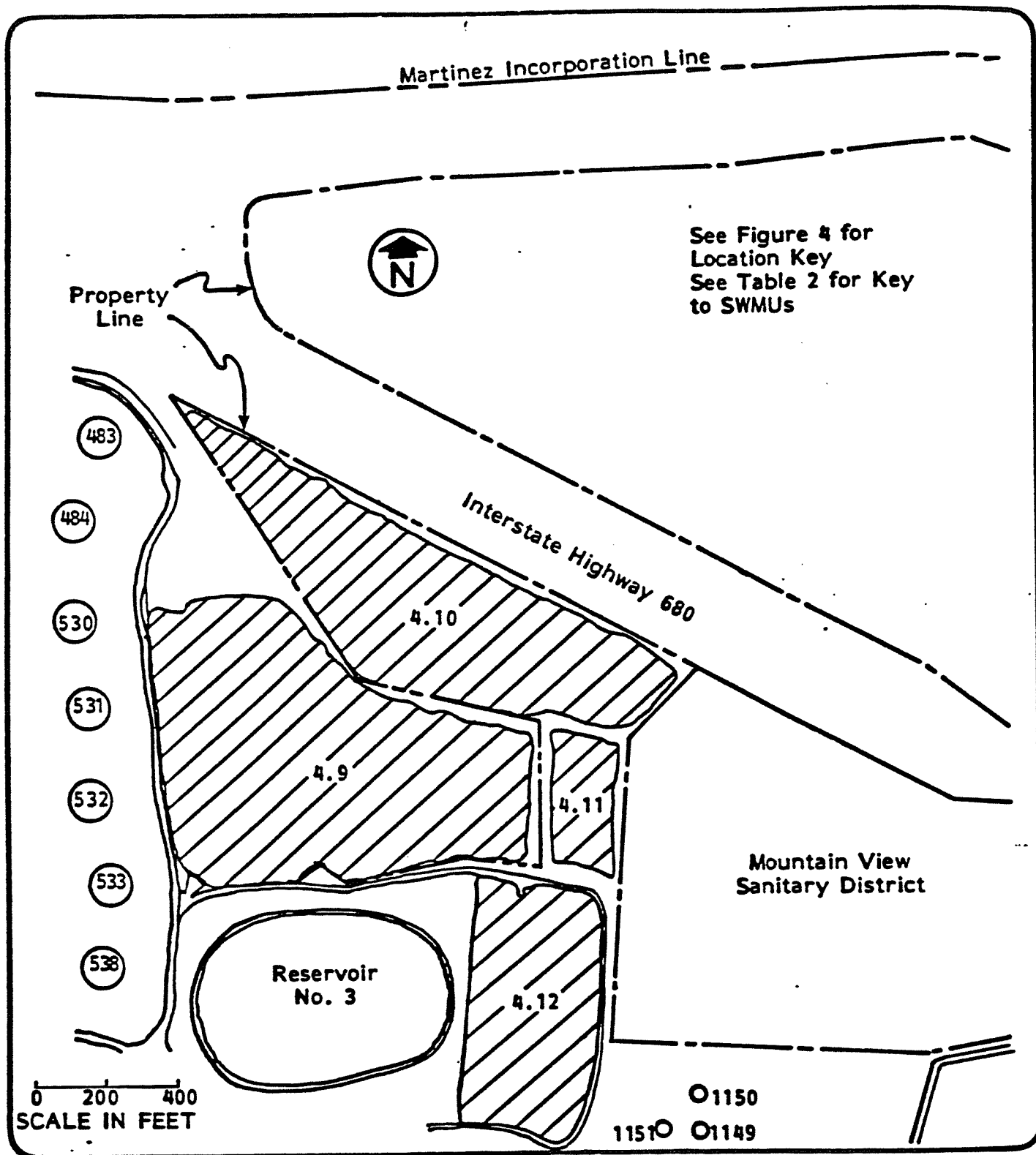


Figure 9  
SHELL OIL COMPANY SWMUs

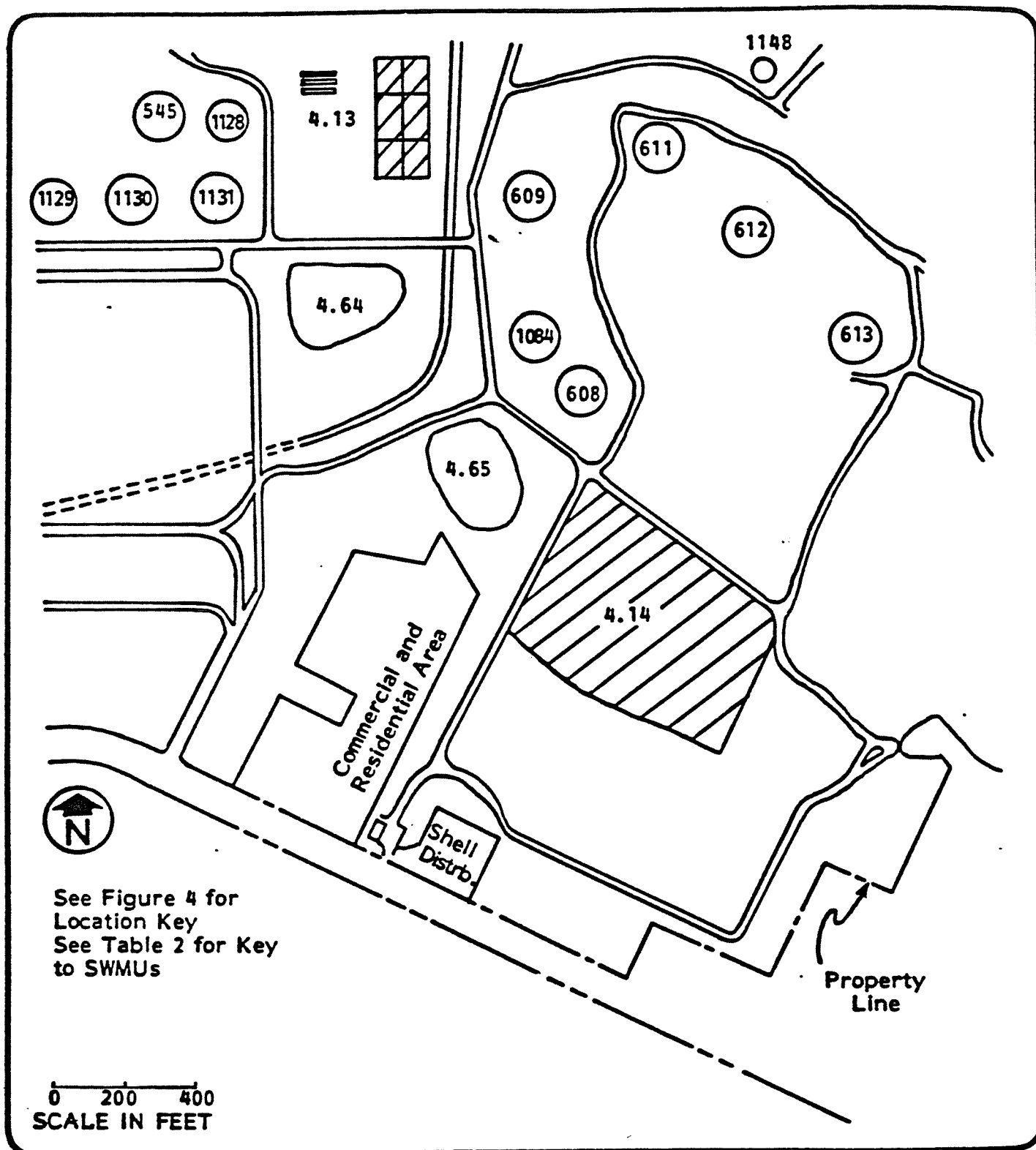


Figure 10  
SHELL OIL COMPANY SWMUs



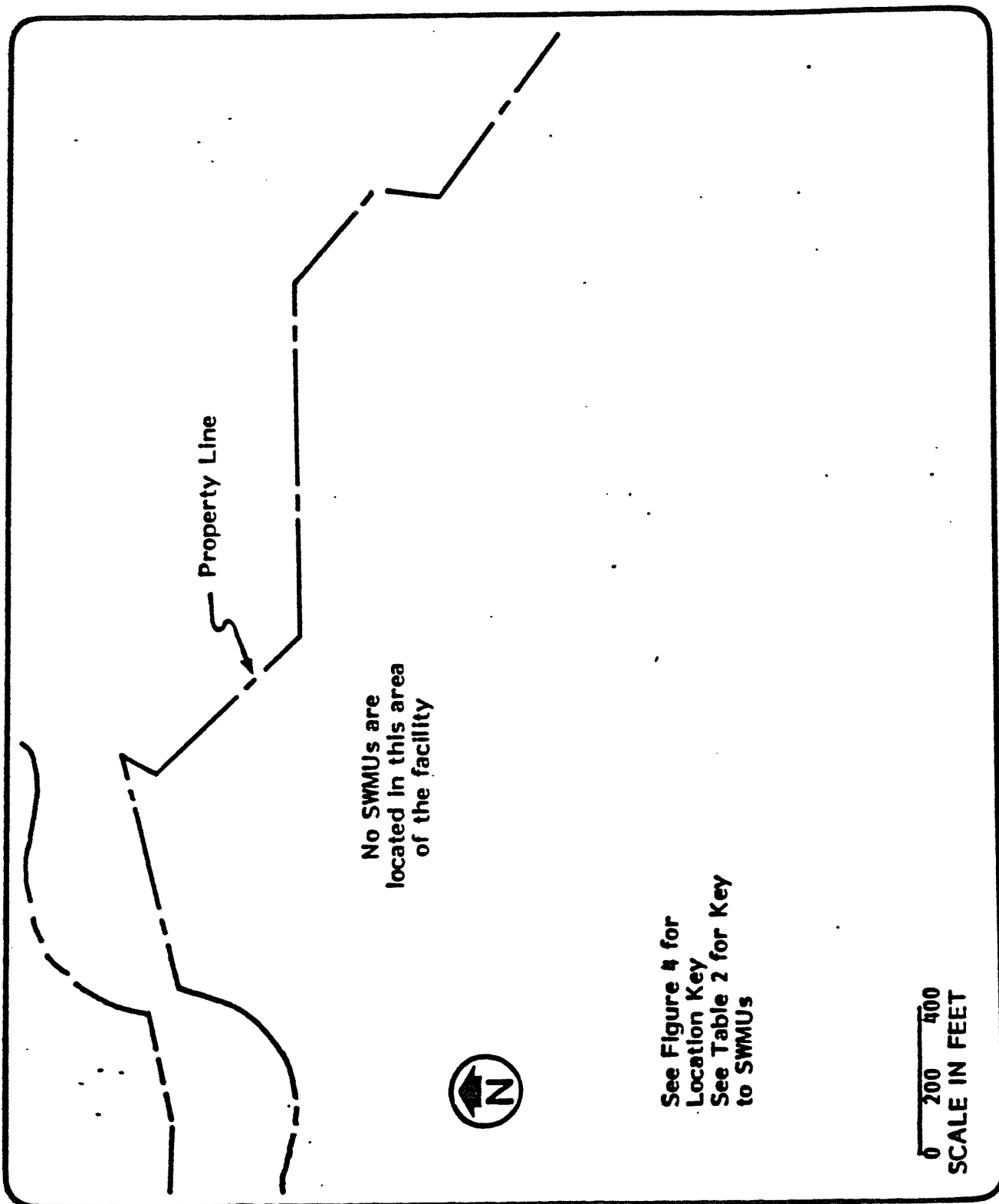


Figure 11

SHELL OIL COMPANY SMUs

Table 1<sup>a</sup>  
List of Active and Inactive Waste Management Units  
Shell Oil Company, Martinez

<u>Unit Label</u> <sup>b</sup>	<u>Unit Name</u>	<u>Unit Type</u> <sup>c</sup>	<u>Status</u> <sup>d</sup>
4.1	Land Treatment Area "FF"	SWMU	I
4.2	Inactive Unit "H"	SWMU	I
4.3	Inactive Unit "I"	SWMU	I
4.4	Inactive Unit "L"	SWMU	I
4.5	Oil Collection Tanks and Sumps	SWMU	I
4.6	Landfill Area "M"	SWMU	I
4.7	Landfill Area "O"	SWMU	I
4.8	Land Disposal Area "Q"	SWMU	I
4.9	Open Burning and Landfill Area	SWMU	I
4.10	Land Disposal Area "X"	SWMU	I
4.11	Impoundment "Y"	SWMU	I
4.12	Landfill Area "Z"	SWMU	I
4.13	Pond Area "AA"	SWMU	I
4.14	Land Disposal Area "DD"	SWMU	I
4.15	Ballast Water Pond	SWMU	I
4.16	Oily Water Sump "N"	SWMU	I
4.17	Oily Water Sump "K"	SWMU	I
4.18	Hazardous Waste Drum Storage Area "J"	SWMU	A
4.19	Waste Transfer Station "MM"	SWMU	A
4.20	PCB Storage Area	SWMU	A
4.21	Gross Oil Separator, Unit "U"	SWMU	A
4.22	Corrugated Plate Interceptor, Unit "TT"	SWMU	A
4.23	CPI Trash Screen and Waste Bin	SWMU	A
4.24	CPI Dumpster Boxes	SWMU	A
4.25	API Separator Bar Screen and Trash Bin	SWMU	A
4.26	API Separator, Unit "E"	SWMU	A
4.27	Sand Boxes, Unit "II"	SWMU	A
4.28	Centrifuge System, Unit "F"	SWMU	I
4.29	Flash Mixer/pH Adjustment, Unit "P"	SWMU	A
4.30	Dissolved Air Flotation, Unit "HH"	SWMU	A
4.31	Final pH Adjustment Unit	SWMU	A
4.32	Biotreater Equalization Feed Ponds, Unit "D"	SWMU	A
4.33	Emergency Wastewater Holding Ponds, Unit "C"	SWMU	A
4.34	Activated Sludge Biotreater	SWMU	A
4.35	Two-Stage Dissolved Air Floatation Clarifiers	SWMU	A
4.36	Biotreater Sludge Thickener, Unit "GG"	SWMU	A
4.37	Biosludge Storage Tank 1197	SWMU	I
4.38	Sand Filter Feed Pond	SWMU	A
4.39	Sand Filters	SWMU	A

Table 1 (Continued)  
List of Active and Inactive Waste Management Units  
Shell Oil Company, Martinez

<u>Unit Label</u>	<u>Unit Name</u>	<u>Unit Type</u>	<u>Status</u>
4.40	Final Holding Pond	SWMU	A
4.41	Sulfide Caustic Flash Pot	SWMU	A
4.42	Caustic Knock-Out Pot	SWMU	A
4.43	Caustic Sump	SWMU	A
4.44	Spent Caustic Storage Tank 952 (Unit "PP")	SWMU	A
4.45	Spent Caustic Neutralizer, Unit "V"	SWMU	A
4.46	Tank 1068	SWMU	A
4.47	Waste Storage Tank 1065, Unit "G"	HWMU	A
4.48	Waste Storage Tank 383, Unit "S"	HWMU	A
4.49	CO Boilers, Unit "T"	HWMU	A
4.50	CO Boilers Dust Storage Hopper	SWMU	A
4.51	CO Boilers Dumpster Box	SWMU	I
4.52	CO Boilers Dust Storage Area	SWMU	A
4.53	Organic Chloride Waste Storage Tank 881T	SWMU	I
4.54	Waste Storage Tank 482, Unit "B"	SWMU	A
4.55	Waste Incinerator, Unit "Z"	HWMU	A
4.56	Two ASD Filter Cake Storage Bins	SWMU	A
4.57	PG&E Sludge Terraces	SWMU	I
4.58	Spent Acid Storage Tank 1218	SWMU	A
4.59	Tank 1064	SWMU	A
4.60	Tank 1063	SWMU	A
4.61	Upper Lake Slobodnik (Storm- water Retention Pond)	SWMU	A
4.62	Lower Lake Slobodnik (Storm- water Retention Pond)	SWMU	A
4.63	Stormwater Holding Pond	SWMU	A
4.64	Flare Area Stormwater Holding Pond	SWMU	A
4.65	Vine Hill Stormwater Holding Pond	SWMU	A
4.66	Stormwater Holding Ponds (Formerly LTA "FF")	SWMU	A
4.67	Inactive Unit "YY"	SWMU	I
4.68	Inactive Unit "ZZ"	SWMU	I

- a. From "RCRA Facility Assessment, Shell Oil Company Martinez Manufacturing Complex" by A.T. Kearney, February, 1988.
- b. Unit number as designated in Figures 3 through 12.
- c. SWMU = Solid Waste Management Unit (a unit that was not reported as managing RCRA-regulated hazardous wastes, but may have managed hazardous constituents), HWMU = Hazardous Waste Management Unit (a unit that is reported to have managed RCRA-regulated hazardous wastes).
- d. I = inactive, A = active.

Table 2  
Ground-water Contamination Found During  
Third Quarter Monitoring (1987) at  
Shell Oil Company Martinez Manufacturing Complex<sup>a</sup>

Geologic Formation	Maximum Levels Detected of: Organics <sup>b</sup>				Metals <sup>c</sup>		
	TOC mg/l	B ug/l	T ug/l	X ug/l	Mn mg/l	Pb mg/l	Ni mg/l
Bay Mud	483	11	10	9	18	.26	.16
Bedrock-Sandstone	18	1.6	3	4	1.3	.36	---
Alluvium-Sand	48	710	2700	3200	7.8	---	---
Alluvium- and/or Silt	390	620	16	560	21	.58	.06
Bedrock-Claystone and/or Siltstone	38	36	2	13	11	.13	2.4

<sup>a</sup> From "Quarterly Groundwater Monitoring Report for Shell Oil Company Martinez Manufacturing Complex" prepared by EMCON Associates and submitted in September, 1987.

<sup>b</sup> TOC = total organic carbon, B = benzene, T = toluene, X = xylene/ethylbenzene.

<sup>c</sup> Mn = manganese, Pb = lead, Ni = nickel.

Identification Numbers of Wells in Which Ground-water Samples Taken During Quarterly Ground-water Monitoring Contained Benzene, Toluene, or Xylene (See Figures 12 and 13 for well locations):

37	60A	61	63	72	74	127	129	136	140
141	148	149	155	163	172	177	178	179	181

Identification Numbers of Wells Containing Floating Hydrocarbon During Quarterly Ground-water Monitoring (See Figures 12 and 13 for well locations):

2	11	12	21	23	24	38	39	53	57
60	62	69	73	102	111	115	124	132	137
139	145	151	165	168	179				

Attachment 21

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI)

AT

SHELL OIL COMPANY, MARTINEZ MANUFACTURING COMPLEX

PURPOSE

The purpose of this RCRA Facility Investigation is to determine the nature and extent of releases of hazardous waste or constituents, identified in Paragraph IV.8 of this Order, from regulated units, solid waste management units, and other source areas at the facility and to gather all necessary data to support the Corrective Measures Study. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA remedial investigation at Shell Oil Company, Martinez Manufacturing Complex.

SCOPE

The RCRA Facility Investigation consists of seven tasks:

Task I: Description of Current Conditions

- A. Facility Background
- B. Nature and Extent of Contamination
- C. Implementation of Interim Measures

Task II: Pre-Investigation Evaluation of Corrective Measure Technologies

Task III: RFI Workplan Requirements

- A. Project Management Plan
- B. Data Collection Quality Assurance Plan
- C. Data Management Plan
- D. Health and Safety Plan
- E. Community Relations Plan

Task IV: Facility Investigation

- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization
- D. Potential Receptor Identification

Task V: Investigation Analysis

- A. Data Analysis
- B. Protection Standards

Task VI: Laboratory and Bench-Scale Studies

Task VII: Reports

- A. Preliminary and Workplan
- B. Progress
- C. Draft and Final

## TASK I: DESCRIPTION OF CURRENT CONDITIONS

Respondent shall submit for U.S. EPA approval a report providing the background information pertinent to the Facility, contamination and interim measures as set forth below. The data gathered during any previous investigations or inspections and other relevant data shall be included.

### A. Facility Background

Respondent's report shall summarize the regional location, pertinent boundary features, general Facility physiography, hydrogeology, and historical use of the Facility for the treatment, storage or disposal of solid and hazardous waste. Respondent's report shall include:

1. Map(s) depicting the following:
  - a. General geographic location;
  - b. Property lines, with the owners of all adjacent property clearly indicated;
  - c. Topography and surface drainage (with a contour interval of 10 feet and a scale of 1 inch = 100 feet) depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surface-water containment areas;
  - d. All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
  - e. All solid or hazardous waste treatment, storage or disposal areas active after November 19, 1980;
  - f. All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980;
  - g. All known past and present product and waste underground tanks or piping;
  - h. Surrounding land uses (residential, commercial, agricultural, recreational); and
  - i. The location of all production and ground-water monitoring wells. These wells shall be clearly labeled and ground and top of casing elevations and construction details included (these elevations and details may be included as an attachment).

All maps shall be consistent with the requirements set forth in 40 CFR §270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site;

2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the Facility;

3. Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and

4. A summary of past permits requested and/or received, any enforcement actions and their subsequent responses and a list of documents and studies prepared for the Facility.

**B. Nature and Extent of Contamination**

Respondent shall prepare and submit for U.S. EPA approval a preliminary report describing the existing information on the nature and extent of contamination.

1. Respondent's report shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected source areas of contamination. For each area, Respondent shall identify the following:

- a. Location of unit/area (which shall be depicted on a facility map);
- b. Quantities of solid and hazardous wastes;
- c. Hazardous waste or constituents, to the extent known; and
- d. Identification of areas where additional information is necessary.

2. Respondent shall prepare an assessment and description of the existing degree and extent of contamination. This should include:

- a. Available monitoring data and qualitative information on locations and levels of contamination at the Facility;
- b. All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and
- c. The potential impact(s) on human health and the environment, including demography, ground-water and surface-water use, and land use.

**C. Implementation of Interim Measures**

Respondent's report shall document interim measures which were or are being undertaken at the Facility. This shall include:

1. Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term solution at the Facility;
2. Design, construction, operation, and maintenance requirements;
3. Schedules for design, construction and monitoring; and
4. Schedule for progress reports.



**TASK II: PRE-INVESTIGATION EVALUATION OF CORRECTIVE MEASURE  
TECHNOLOGIES**

Prior to starting the Facility investigation, Respondent shall submit to EPA a report that identifies the potential corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report shall also identify any field data that needs to be collected in the Facility investigation to facilitate the evaluation and selection of the final corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

### TASK III: RFI WORKPLAN REQUIREMENTS

Respondent shall prepare a RCRA Facility Investigation (RFI) Workplan. This RFI Workplan shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the Facility-specific situation. The RFI Workplan includes the following:

#### A. Project Management Plan

Respondent shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan will also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RCRA Facility Investigation.

#### B. Data Collection Quality Assurance Plan

Respondent shall prepare a plan to document all monitoring procedures: sampling, field measurements and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented.

##### 1. Data Collection Strategy

The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

- a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;
- b. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;
- c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition or an environmental condition. Examples of factors which shall be considered and discussed include:
  - i) Environmental conditions at the time of sampling;
  - ii) Number of sampling points;
  - iii) Representativeness of selected media; and

- iv) Representativeness of selected analytical parameters.
- d. Description of the measures to be taken to assure that the following data sets can be compared to each other:
  - i) RFI data generated by Respondent over some time period;
  - ii) RFI data generated by an outside laboratory or consultant versus data generated by Respondent;
  - iii) Data generated by separate consultants or laboratories; and
  - iv) Data generated by an outside consultant or laboratory over some time period.
- e. Details relating to the schedule and information to be provided in quality assurance reports. The reports should include but not be limited to:
  - i) Periodic assessment of measurement data accuracy, precision, and completeness;
  - ii) Results of performance audits;
  - iii) Results of system audits;
  - iv) Significant quality assurance problems and recommended solutions; and
  - v) Resolutions of previously stated problems.

## 2. Sampling

The Sampling section of the Data Collection Quality Assurance Plan shall discuss:

- a. Selecting appropriate sampling locations, depths, etc.;
- b. Providing a statistically sufficient number of sampling sites;
- c. Measuring all necessary ancillary data;
- d. Determining conditions under which sampling should be conducted;
- e. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);
- f. Determining which parameters are to be measured and where;
- g. Selecting the frequency of sampling and length of sampling period;
- h. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;
- i. Measures to be taken to prevent contamination if the sampling equipment and cross contamination between sampling points;
- j. Documenting field sampling operations and procedures, including;

- i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);
  - ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
  - iii) Documentation of specific sample preservation method;
  - iv) Calibration of field devices;
  - v) Collection of replicate samples;
  - vi) Submission of field-biased blanks, where appropriate;
  - vii) Potential interferences present at the Facility;
  - viii) Construction materials and techniques, associated with monitoring wells and piezometers;
  - ix) Field equipment listing and sample containers;
  - x) Sampling order; and
  - xi) Decontamination procedures.
- k. Selecting appropriate sample containers;
  - l. Sample preservation; and
  - m. Chain-of-custody, including:
    - i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment; and
    - ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

### 3. Field Measurements

The Field Measurements section of the Data Collection Quality Assurance Plan shall discuss:

- a. Selecting appropriate field measurement locations, depths, etc.;
- b. Providing a statistically sufficient number of field measurements;
- c. Measuring all necessary ancillary data;
- d. Determining conditions under which field measurement should be conducted;
- e. Determining which media are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);
- f. Determining which parameters are to be measured and where;
- g. Selecting the frequency of field measurement and length of field measurements period; and

- h. Documenting field measurement operations and procedures, including:
- i) Procedures and forms for recording raw data and the exact location, time, and facility-specific considerations associated with the data acquisition;
  - ii) Calibration of field devices;
  - iii) Collection of replicate measurements;
  - iv) Submission of field-biased blanks, where appropriate;
  - v) Potential interferences present at the Facility;
  - vi) Construction materials and techniques associated with monitoring wells and piezometers use to collect field data;
  - vii) Field equipment listing;
  - viii) Order in which field measurements were made; and
  - ix) Decontamination procedures.

#### 4. Sample Analysis

The Sample Analysis section of the Data Collection Quality Assurance Plan shall specify the following:

- a. Chain-of-custody procedures, including:
- i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;
  - ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
  - iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersment for analysis.
- b. Sample storage procedures and storage times;
- c. Sample preparation methods;
- d. Analytical procedures, including:
- i) Scope and application of the procedure;
  - ii) Sample matrix;
  - iii) Potential interferences;
  - iv) Precision and accuracy of the methodology; and
  - v) Method detection limits.
- e. Calibration procedures and frequency;
- f. Data reduction, validation and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

- i) Method blank(s);
- ii) Laboratory control sample(s);
- iii) Calibration check sample(s);
- iv) Replicate sample(s);
- v) Matrix-spiked sample(s);
- vi) "Blind" quality control sample(s);
- vii) Control charts;
- viii) Surrogate samples;
- ix) Zero and span gases; and
- x) Reagent quality control checks.

- h. Preventive maintenance procedures and schedules;
- i. Corrective action (for laboratory problems); and
- j. Turnaround time.

C. Data Management Plan

Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

- a. Unique sample or field measurement code;
- b. Sampling or field measurement location and sample or measurement type;
- c. Sampling or field measurement raw data;
- d. Laboratory analysis ID number;
- e. Property or component measured; and
- f. Result of analysis (e.g., concentration).

2. Tabular Displays

The following data shall be presented in tabular displays:

- a. Unsorted (raw) data;
- b. Results for each medium, or for each constituent monitored;
- c. Data reduction for statistical analysis;
- d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
- e. Summary data.

### 3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

- a. Display sampling location and sampling grid;
- b. Indicate boundaries of sampling area, and areas where more data are required;
- c. Displays levels of contamination at each sampling location;
- d. Display geographical extent of contamination;
- e. Display contamination levels, averages, and maxima;
- f. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and
- g. Indicate features affecting intramedia transport and show potential receptors.

### D. Health and Safety Plan

Respondent shall prepare a Facility Health and Safety Plan.

1. Major elements of the Health and Safety Plan shall include:
  - a. Facility description including availability of resources such as roads, water supply, electricity and telephone service;
  - b. Describe the known hazards and evaluate the risks associated with the incident and with each activity conducted;
  - c. List key personnel and alternates responsible for site safety, responses operations, and for protection of public health;
  - d. Delineate work area;
  - e. Describe levels of protection to be worn by personnel in work area;
  - f. Establish procedures to control site access;
  - g. Describe decontamination procedures for personnel and equipment;
  - h. Establish site emergency procedures;
  - i. Address emergency medical care for injuries and toxicological problems;
  - j. Describe requirements for an environmental surveillance program;
  - k. Specify any routine and special training required for responders; and
  - l. Establish procedures for protecting workers from weather-related problems.

2. The Facility Health and Safety Plan shall be consistent with:

- a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
- b. EPA Order 1440.1 - Respiratory Protection;
- c. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
- d. Facility Contingency Plan;
- e. EPA Standard Operating Safety Guide (1984); f. OSHA regulations particularly in 29 C.F.R. §1910 and §1926;
- g. State and local regulations; and
- h. Other EPA guidance as provided.

E. Community Relations Plan

Respondent shall prepare a plan, for the dissemination of information to the public regarding investigation activities and results.



#### TASK IV: FACILITY INVESTIGATION

Respondent shall conduct those investigations necessary to: characterize the Facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors.

The investigations should result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative or alternatives during the Corrective Measures Study.

The site investigation activities shall follow the plans set forth in Task III. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

##### A. Environmental Setting

Respondent shall collect information to supplement and verify existing information on the environmental setting at the Facility. Respondent shall characterize the following:

##### 1. Hydrogeology

Respondent shall conduct a program to evaluate hydrogeologic conditions at the Facility. This program shall provide the following information:

- a. A description of the regional and Facility-specific geologic and hydrogeologic characteristics affecting ground-water flow beneath the Facility, including:
  - i) Regional and Facility-specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;
  - ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);
  - iii) Depositional history;
  - iv) Identification and characterization of areas and amounts of recharge and discharge.
  - v) Regional and Facility-specific ground-water flow patterns; and
  - vi) Characterize seasonal variations in the ground-water flow regime.
- b. An analysis of any topographic features that might influence the ground-water flow system.

- c. Based on field data, test, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the Facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:
- i) Hydraulic conductivity and porosity (total and effective);
  - ii) Lithology, grain size, sorting, degree of cementation;
  - iii) An interpretation of hydraulic interconnections between saturated zones; and
  - iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content etc.).
- d. Based on field studies and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways identifying:
- i) Sand and gravel deposits in unconsolidated deposits;
  - ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;
  - iii) Zones of higher permeability or low permeability that might direct and restrict the flow of contaminants;
  - iv) The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs; and
  - v) Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration including perched zones of saturation.
- e. Based on data obtained from ground-water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:
- i) Water-level contour and/or potentiometric maps;
  - ii) Hydrologic cross sections showing vertical gradients;
  - iii) The flow system, including the vertical and horizontal components of flow; and

- iv) Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences.
- f. A description of manmade influences that may affect the hydrogeology of the site, identifying:
  - i) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and
  - ii) Manmade hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

## **2. Soils**

Respondent shall conduct a program to characterize the soil and rock units above the water table in the vicinity of the contaminant release(s). Such characterization shall include but not be limited to, the following information:

- a. SCS soil classification;
- b. Surface soil distribution;
- c. Soil profile, including ASTM classification of soils;
- d. Transects of soil stratigraphy;
- e. Hydraulic conductivity (saturated and unsaturated);
- f. Relative permeability;
- g. Bulk density;
- h. Porosity;
- i. Soil sorptive capacity;
- j. Cation exchange capacity (CEC);
- k. Soil organic content;
- l. Soil pH;
- m. Particle size distribution;
- n. Depth of water table;
- o. Moisture content;
- p. Effect of stratification on unsaturated flow;
- q. Infiltration
- r. Evapotranspiration;
- s. Storage capacity;
- t. Vertical flow rate; and
- u. Mineral content.

## **3. Surface Water and Sediment**

Respondent shall conduct a program to characterize the surface - water bodies in the vicinity of the Facility. Such characterization shall include, but not be limited to, the following activities and information:

- a. Description of the temporal and permanent surface-water bodies including:
  - i) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;
  - ii) For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;
  - iii) For streams, ditches, drains, swamps and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100 year event);
  - iv) Drainage patterns; and
  - v) Evapotranspiration.
- b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients ( $\text{NH}_3$ ,  $\text{NO}_3^-/\text{NO}_2^-$ ,  $\text{PO}_4^{3-}$ ), chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.
- c. Description of sediment characteristics including:
  - i) Deposition area;
  - ii) Thickness profile; and
  - iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

#### 4. Air

Respondent shall provide information characterizing the climate in the vicinity of the Facility. Such information shall include, but not be limited to:

- a. A description of the following parameters:
  - i) Annual and monthly rainfall averages;
  - ii) Monthly temperature averages and extremes;
  - iii) Wind speed and direction;
  - iv) Relative humidity/dew point;
  - v) Atmospheric pressure;
  - vi) Evaporation data;
  - vii) Development of inversions; and
  - viii) Climate extremes that have been known to occur in the vicinity of the Facility, including frequency of occurrence.

- b. A description of topographic and manmade features which affect air flow and emission patterns, including:

- i) Ridges, hills or mountain areas;
- ii) Canyons or valleys;
- iii) Surface water bodies (e.g. rivers, lakes, bays, etc.);
- iv) Wind breaks and forests; and
- v) Buildings.

## B. Source Characterization

Respondent shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, collected or removed including: type; quantity; physical form; disposition (containment or nature of deposits); and Facility characteristics affecting release (e.g., Facility security, and engineered barriers). This shall include quantification of the following specific characteristics, at each source area:

### 1. Unit/Disposal Area characteristics:

- a. Location of unit/disposal area;
- b. Type of unit/disposal area;
- c. Design features;
- d. Operating practices (past and present);
- e. Period of operation;
- f. Age of unit/disposal area;
- g. General physical conditions; and
- h. Method used to close the unit/disposal area.

### 2. Waste Characteristics:

- a. Type of waste placed in the unit;
  - i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);
  - ii) Quantity; and
  - iii) Chemical composition.
- b. Physical and chemical characteristics;
  - i) Physical form (solid, liquid, gas);
  - ii) Physical description (e.g., powder, oily sludge);
  - iii) Temperature;
  - iv) pH;
  - v) General chemical class (e.g., acid, base, solvent);
  - vi) Molecular weight;
  - vii) Density;

- viii) Boiling point;
- ix) Viscosity;
- x) Solubility in water;
- xi) Cohesiveness of the waste;
- xii) Vapor pressure.
- xiii) Flash point

c. Migration and dispersal characteristics of the waste;

- i) Sorption;
- ii) Biodegradability, bioconcentration, biotransformation;
- iii) Photodegradation rates;
- iv) Hydrolysis rates; and
- v) Chemical transformations.

Respondent shall document the procedures used in making the above determinations.

C. Contamination Characterization

Respondent shall collect analytical data on ground-water, soils, surface water, sediment, and subsurface gas contamination in the vicinity of the Facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, and conditions during sampling, and the identity of the individuals performing the sampling and analysis. Respondent shall address the following types of contamination at the Facility:

1. Ground-water Contamination

Respondent shall conduct a Ground-water Investigation to characterize any plumes of contamination at the Facility. This investigation shall at a minimum provide the following information:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility;
- b. The horizontal and vertical direction of contamination movement;
- c. The velocity of contaminant movement;
- d. The horizontal and vertical concentration profiles of 40 C.F.R. §264 Appendix IX constituents in the plume(s);
- e. An evaluation of factors influencing the plume movement; and
- f. An extrapolation of future contaminant movement.

Respondent shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

## **2. Soil Contamination**

Respondent shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. The investigation shall include the following information:

- a. A description of the vertical and horizontal extent of contamination.
- b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation.
- c. Specific contaminant concentrations.
- d. The velocity and direction of contaminant movement.
- e. An extrapolation of future contaminant movement.

Respondent shall document the procedures used in making the above determinations.

## **3. Surface-Water and Sediment Contamination**

Respondent shall conduct a surface-water investigation to characterize contamination in surface-water bodies resulting from contaminant releases at the Facility. The investigation shall include, but not be limited to, the following information:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility, and the extent of contamination in underlying sediments;
- b. The horizontal and vertical direction of contaminant movement;
- c. The contaminant velocity;
- d. An evaluation of the physical, biological and chemical factors influencing contaminant movement;

- e. An extrapolation of future contaminant movement; and
- f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.;

Respondent shall document the procedures used in making the above determinations.

#### 4. Air Contamination

Respondent shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere. This investigation shall provide the following information:

- a. A description of the horizontal and vertical direction and velocity of contaminant movement;
- b. The rate and amount of the release; and
- c. The chemical and physical composition of the contaminants(s) released, including horizontal and vertical concentration profiles.

Respondent shall document the procedures used in making the above determinations.

#### 5. Subsurface Gas Contamination

Respondent shall conduct an investigation to characterize subsurface gases emitted from buried hazardous waste and hazardous constituents in the ground water. This investigation shall include the following information:

- a. A description of the horizontal and vertical extent of subsurface gases mitigation;
- b. The chemical composition of the gases being emitted;
- c. The rate, amount, and density of the gases being emitted; and
- d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

Respondent shall document the procedures used in making the above determinations.



**D. Potential Receptors**

Respondent shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the Facility. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be obtained. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:
  - a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and
  - b. Location of groundwater users including wells and discharge areas.
2. Local uses and possible future uses of surface waters draining the Facility:
  - a. Domestic and municipal (e.g. potable and lawn/gardening watering);
  - b. Recreational (e.g. swimming, fishing);
  - c. Agricultural;
  - d. Industrial; and
  - e. Environmental (e.g. fish and wildlife propagation).
3. Human use of or access to the Facility and adjacent lands, including but not limited to:
  - a. Recreation;
  - b. Hunting;
  - c. Residential;
  - d. Commercial;
  - e. Zoning; and
  - f. Relationship between population locations and prevailing wind direction.
4. A description of the biota in surface water bodies on, adjacent to, or affected by the Facility.
5. A description of the ecology overlying and adjacent to the Facility.
6. A demographic profile of the people who use or have access to the Facility and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.
7. A description of any endangered or threatened species near the Facility.

## TASK V: INVESTIGATION ANALYSIS

Respondent shall prepare an analysis and summary of all Facility investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study.

### A. Data Analysis

Respondent shall analyze all Facility investigation data outlined in Task IV and prepare a report on the type and extent of contamination at the Facility including sources and migration pathways. The report shall describe the extent of contamination (qualitative/ quantitative) in relation to background levels indicative for the area.

### B. Protection Standards [where applicable]

#### 1. Ground-water Protection Standards

For regulated units Respondent shall provide information to support the Agency's selection/development of Ground-water Protection Standards for all of the Appendix VIII constituents found in the ground-water during the Facility Investigation (Task IV).

##### a. The Groundwater Protection Standards shall consist of:

- i) for any constituents listed in Table 1 of 40 C.F.R. §264.94, the respective value given in that table (MCL) if the background level of the constituent is below the given in Table 1; or
- ii) the background level of that constituent in the groundwater; or
- iii) a U.S. EPA approved Alternate Concentration Limit (ACL).

##### b. Information to support the Agency's subsequent selection of Alternate Concentration Limits (ACL's) shall be developed by Respondent in accordance with U.S. EPA guidance. For any proposed ACL's Respondent shall include a justification based upon the criteria set forth in 40 C.F.R. §264.94(b).

- c. Within thirty (30) days of receipt of any proposed ACL's. The U.S. EPA shall notify Respondent in writing of approval, disapproval or modifications, the U.S. EPA shall specify in writing the reason(s) for any disapproval or modification.
- d. Within thirty days of receipt of the U.S. EPA's notification or disapproval of any proposed ACL, Respondent shall amend and submit revisions to the U.S. EPA.

## **2. Other Relevant Protection Standards**

Respondent shall identify all relevant and applicable standards for the protection of human health and the environment (e.g. National Ambient Air Quality Standards, Federally-approved state water quality standards, etc.).

#### **TASK VI: LABORATORY AND BENCH-SCALE STUDIES**

Respondent shall conduct laboratory and/or bench scale studies to determine the applicability of a corrective measure technology or technologies to Facility conditions. Respondent shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

Respondent shall develop a testing plan identifying the types(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of the testing, Respondent shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

Respondent shall prepare a report summarizing the testing program and its results, both positive and negative.

## TASK VII: REPORTS

### A. Preliminary and Workplan

Respondent shall submit to the EPA reports on Tasks I and II when it submits the RCRA Facility Investigation Workplan (Task III).

### B. Progress

Respondent shall at a minimum provide the EPA with signed, bimonthly progress reports containing:

1. A description and estimate of the percentage of the RFI completed;
2. Summaries of all findings;
3. Summaries of all changes made in the RFI during the reporting period;
4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, laboratory/ monitoring data, etc.

### C. Draft and Final

Upon EPA approval, Respondent shall prepare a RCRA Facility Investigation Report to present Tasks IV-V. The RCRA Facility investigation Report shall be developed in draft form for U.S. EPA review. The RCRA Facility Investigation Report shall be developed in final format incorporating comments received on the Draft RCRA Facility Investigation Report. Task VI shall be submitted as a separate report when the Final RCRA Facility Investigation Report is submitted.

Three copies of all reports, including the Task I report, Task II report, Task III workplan, Task VI report and both the Draft and Final RCRA Facility Investigation Reports (Task IV-V) shall be provided by Respondent to U.S. EPA. One additional copy of each report will be provided by Respondent to the California Department of Health Services and the Regional Water Quality Control Board.

### Facility Submission Summary

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below:

Facility Submission	Due Date
Description of Current Situation (Task I)	one hundred and eighty (180) days from the effective date of this Order
Pre-Investigation Evaluation of Corrective Measure Technologies (Task II)	one hundred and eighty (180) days from the effective date of this Order
Preliminary RFI Workplan (Task III)	one hundred and eighty (180) days from the effective date of this Order
Final RFI Workplan (Task III)	thirty (30) days from the receipt of EPA comments on the draft Workplan, unless otherwise specified
Draft RFI Report (Tasks IV and V)	according to the approved schedule in the RFI Workplan, or alternate date approved by EPA
Final RFI Report (Tasks IV and V)	thirty (30) days after EPA comment on Draft RFI Report
Laboratory and Bench-Scale Studies (Task VI)	Concurrent with Final RFI Report
Progress Reports on Tasks I through VI	BI-MONTHLY

SCOPE OF WORK FOR A CORRECTIVE MEASURE STUDY  
AT  
SHELL OIL COMPANY, MARTINEZ MANUFACTURING COMPLEX

PURPOSE

The purpose of this Corrective Measure Study (CMS) is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken at Shell Oil Company, Martinez Manufacturing Complex. Respondent will furnish the personnel, materials, and services necessary to prepare the corrective measure study, except as otherwise specified.

SCOPE

The Corrective Measure Study consists of four tasks:

- Task VIII: Identification and Development of the Corrective Measure Alternative or Alternatives
- A. Description of Current Situation
  - B. Establishment of Corrective Action Objectives
  - C. Screening of Corrective Measures Technologies
  - D. Identification of the Corrective Measure Alternative or Alternatives
- Task IX: Evaluation of the Corrective Measure Alternative or Alternatives
- A. Technical/Environmental/Human Health/Institutional
  - B. Cost Estimate
- Task X: Justification and Recommendation of the Corrective Measure or Measures
- A. Technical
  - B. Environmental
  - C. Human Health
- Task XI: Reports
- A. Progress
  - B. Draft
  - C. Final

**TASK VIII: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES**

Based on the results of the RCRA Facility Investigation and consideration of the identified Preliminary Corrective Measure Technologies (Task II), Respondent shall identify, screen and develop the alternative or alternatives for removal, containment, treatment and/or other remediation of the contamination based on the objectives established for the corrective action.

**A. Description of Current Situation**

Respondent shall submit an update to the information describing the current situation at the Facility and the known nature and extent of the contamination as documented by the RCRA Facility Investigation Report. Respondent shall provide an update to information presented in Task I of the RFI to the Agency regarding previous response activities and any interim measures which have or are being implemented at the Facility. Respondent shall also make a Facility-specific statement of the purpose for the response, based on the results of the RCRA Facility Investigation. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

**B. Establishment of Corrective Action Objectives**

Respondent, in conjunction with the U.S. EPA, shall establish site specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RCRA Facility Investigation, EPA guidance, and the requirements of any applicable Federal statutes. At a minimum, all corrective actions concerning ground water releases from regulated units must be consistent with, and as stringent as, those required under 40 C.F.R. §264.100.

**C. Screening of Corrective Measure Technologies**

Respondent shall review the results of the RCRA Facility Investigation and reassess the technologies specified in Task II and to identify additional technologies which are applicable at the Facility. Respondent shall screen the preliminary corrective measure technologies identified in Task II of the RCRA Facility investigation and any supplemental technologies to eliminate those that may prove unfeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set



of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations.

Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

**1. Site Characteristics**

Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration;

**2. Waste Characteristics**

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site); and

**3. Technology Limitations**

During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

**D. Identification of the Corrective Measure Alternative or Alternatives**

Respondent shall develop the Corrective measure alternative or alternatives based on the corrective action objectives and analysis of Preliminary Corrective Measure Technologies, as presented in Task II of the RCRA Facility investigation and as supplemented following the preparation of the RFI Report. Respondent shall rely on engineering practice to determine which of the previously identified technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternative or alternatives. The alternative or alternatives developed should represent a workable number of option(s) that each

appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. Respondent shall document the reasons for excluding technologies, identified in Task II, as supplemented in the development of the alternative or alternatives.

**TASK IX: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES**

Respondent shall describe each corrective measure alternative that passes through the Initial Screening in Task VIII and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human health and institutional concerns. Respondent shall also develop cost estimates of each corrective measure.

**A. Technical/Environmental/Human Health/Institutional**

Respondent shall provide a description of each corrective measure alternative which includes but is not limited to the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. Respondent shall evaluate each alternative in the four following areas:

**1. Technical;**

Respondent shall evaluate each corrective measure alternative based on performance, reliability, implementability and safety.

**a. Respondent shall evaluate performance based on the effectiveness and useful life of the corrective measure:**

- i) Effectiveness shall be evaluated in terms of the ability to perform intended functions, such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness shall be considered. The evaluation should also consider the effectiveness of combinations of technologies; and**
- ii) Useful life is defined as the length of time the level of effectiveness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the**

future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

- b. Respondent shall provide information on the reliability of each corrective measure including their operation and maintenance requirements and their demonstrated reliability:
  - i) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and
  - ii) Demonstrated and expected reliability is a way of measuring the risk and effect of failure. Respondent should evaluate whether the technologies have been used effectively under analogous conditions; whether the combination of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.
- c. Respondent shall describe the implementability of each corrective measure including the relative ease of installation (constructability) and the time required to achieve a given level of response:
  - i) Constructability is determined by conditions both internal and external to the Facility conditions and include such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the Facility (i.e., remote location vs. a congested urban area). Respondent shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities; and

- ii) Time has two components that shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.
- d. Respondent shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider are fire, explosion, and exposure to hazardous substances.

## 2. Environmental;

Respondent shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on the Facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short- and long-term beneficial and adverse effects of the response alternative; any adverse effects on environmentally sensitive areas; and an analysis of measures to mitigate adverse effects.

## 3. Human Health; and

Respondent shall assess each alternative in terms of the extent of which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementation the corrective measure. The assessment will describe the levels and characterizations of contaminants on-site, potential exposure routes, and potentially affected population. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, or guidelines acceptable to EPA.

## 4. Institutional.

Respondent shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, state and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative.

## **B. Cost Estimate**

Respondent shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (non-construction and overhead) costs.

- a. Direct capital costs include:

- i) Construction costs: Costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure.
- ii) Equipment costs: Costs of treatment, containment, disposal and/or service equipment necessary to implement the action; these materials remain until the corrective action is complete;
- iii) Land and site-development costs: Expenses associated with purchase of land and development of existing property; and
- iv) Buildings and services costs: Costs of process and non-process buildings, utility connections, purchased services, and disposal costs.

- b. Indirect capital costs include:

- i) Engineering expenses: Costs of administration, design, construction supervision, drafting, and testing of corrective measure alternatives;
- ii) Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;
- iii) Startup and shakedown costs: Costs incurred during corrective measure startup; and
- iv) Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate Facility characterization.

2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. Respondent shall consider the following operation and maintenance cost components:

- a. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;
- b. Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;
- c. Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;
- d. Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;
- e. Disposal and treatment costs: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operations;
- f. Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;
- g. Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accidental insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;
- h. Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and
- i. Other costs: Items that do not fit any of the above categories.

**TASK X: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE  
MEASURE OR MEASURES**

Respondent shall justify and recommend a corrective measure alternative using technical, human health, and environmental criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Tradeoffs among health risks, environmental effects, and other pertinent factors shall be highlighted. The U.S. EPA will select the corrective measure alternative or alternatives to be implemented based on the results of Tasks IX and X. At a minimum, the following criteria will be used to justify the final corrective measure or measures.

**A. Technical**

1. Performance - corrective measure or measures which are most effective at performing their intended functions and maintaining the performance over extended periods of time will be given preference;
2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and that have proven effective under waste and Facility conditions similar to those anticipated will be given preference;
3. Implementability - corrective measure or measures which can be constructed and operating to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; and
4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

**B. Human Health**

The corrective measure or measures must comply with existing U.S. EPA criteria, standards, or guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

**C. Environmental**

The corrective measure or measures posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment will be favored.



## TASK XI: REPORTS

### A. Corrective Measures Study Workplan

Respondent shall submit to EPA a Preliminary Corrective Measures Study Workplan within thirty (30) days of approval of the final RFI Report. Respondent will finalize its Workplan within thirty (30) days of receipt of comments from EPA.

### B. Progress

Respondent shall at a minimum provide the EPA with signed, bimonthly progress reports containing:

1. A description and estimate of the percentage of the CMS completed;
2. Summaries of all findings;
3. Summaries of all changes made in the CMS during the reporting period;
4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel during reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, laboratory/ monitoring data, etc.

### C. Draft

Respondent shall prepare a Corrective Measure Study Report presenting the results of Task VIII through X and recommending a corrective measure alternative or alternatives. Three copies of the preliminary report shall be provided by Respondent to EPA. The Report shall at a minimum include:

1. A description of the Facility;
  - a. Site topographic map & preliminary layouts.
2. A summary of the corrective measure or measures;
  - a. Description of the corrective measure or measures and rationale for selection;
  - b. Performance expectations;
  - c. Preliminary design criteria and rationale;
  - d. General operation and maintenance requirements; and
  - e. Long-term monitoring requirements.

3. A summary of the RCRA Facility Investigation and impact on the selected corrective measure or measures;
  - a. Field studies (ground-water, surface water, soil, air); and
  - b. Laboratory studies (bench scale, pick scale).
4. Design and Implementation Precautions;
  - a. Special technical problems;
  - b. Additional engineering data required;
  - c. Permits and regulatory requirements;
  - d. Access, easements, right-of-way;
  - e. Health and safety requirements; and
  - f. Community relations activities.
5. Cost Estimates and Schedules;
  - a. Capital cost estimate;
  - b. Operation and maintenance cost estimate; and
  - c. Project schedule (design, construction, operation).

C. Final

Respondent shall finalize the Corrective Measure Study Report incorporating comments received from EPA on the Draft Corrective Measure Study Report.

### Facility Submission Summary

A summary of the information reporting requirements contained in the Corrective Measure Study Scope of Work is presented below:

Facility Submission	Due Date
Preliminary CMS Workplan	thirty (30) days after approval of RFI report
Final CMS Workplan	thirty (30) days from the receipt of EPA comments on the draft Workplan
Draft CMS Report (Tasks VIII, IX, and X)	according to the approved schedule in the CMS Workplan
Final CMS Report (Tasks VIII, IX, and X)	thirty (30) days after EPA comments on the Draft CMS
Progress Reports on Tasks VIII, IX, and X	BI-MONTHLY